STATISTICAL PERSPECTIVE OF CORONA ATTACK COVID-19

By

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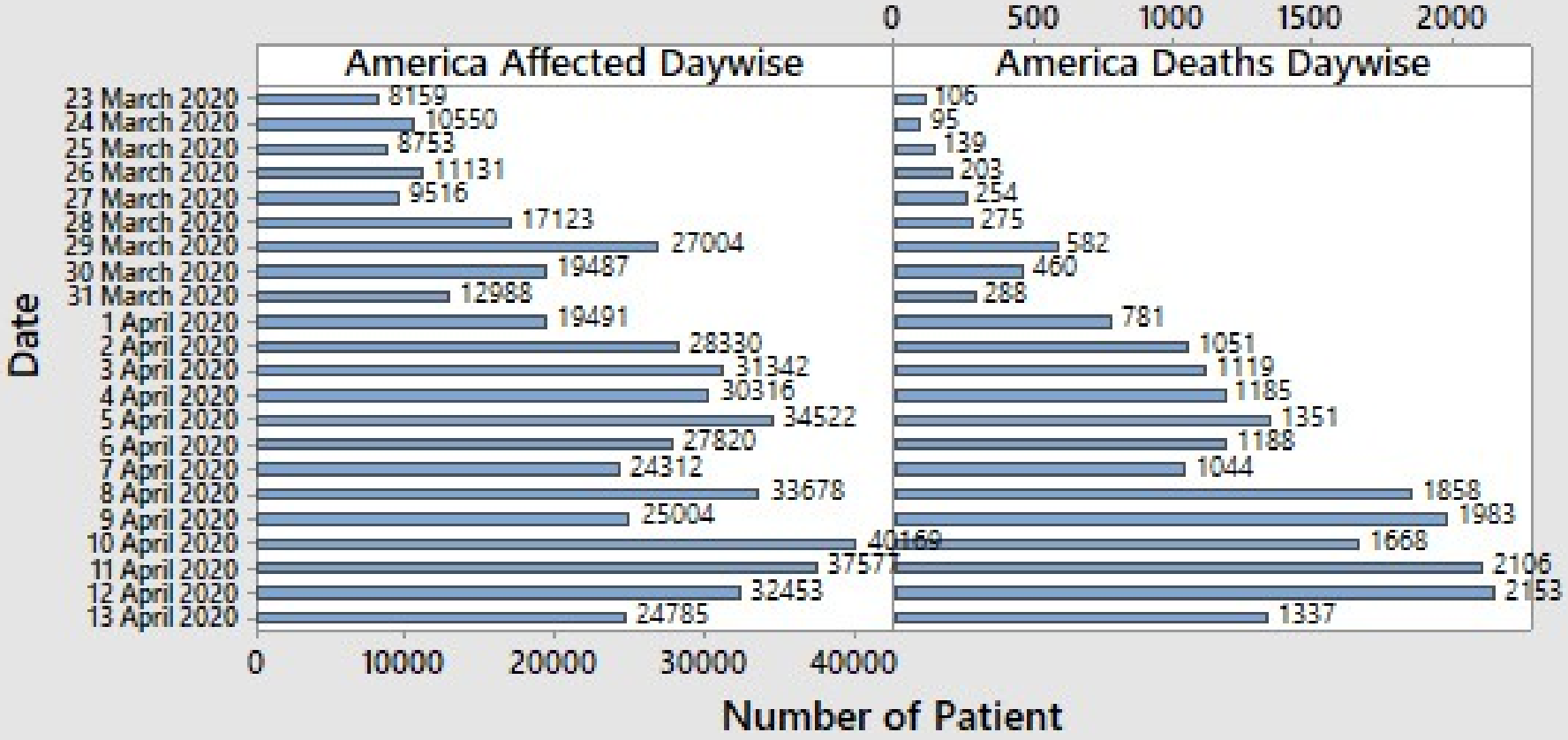
STATISTICAL PERSPECTIVE OF CORONA ATTACK

- The purpose of the study is to determine if there is a relationship between the rate of affected patients of Corona and the rate of deaths by Corona attack as studied by Correlation and Regression analysis.
- Correlation measures the strength of the association between variables like rate of affected patients and rate of deaths by corona.
- Regression quantifies the association. It should only be used if one of the variables is thought to precede or cause the other
- Data were collected from the Corona affected countries like America, Italy, Spain, Iran, France, England, India, Pakistan and China. These data already had been published in the “Thinathanthi” a Tamil Daily news paper

STATISTICAL PERSPECTIVE OF CORONA ATTACK IN AMERICA

COVID-19

Stay home, Save lives

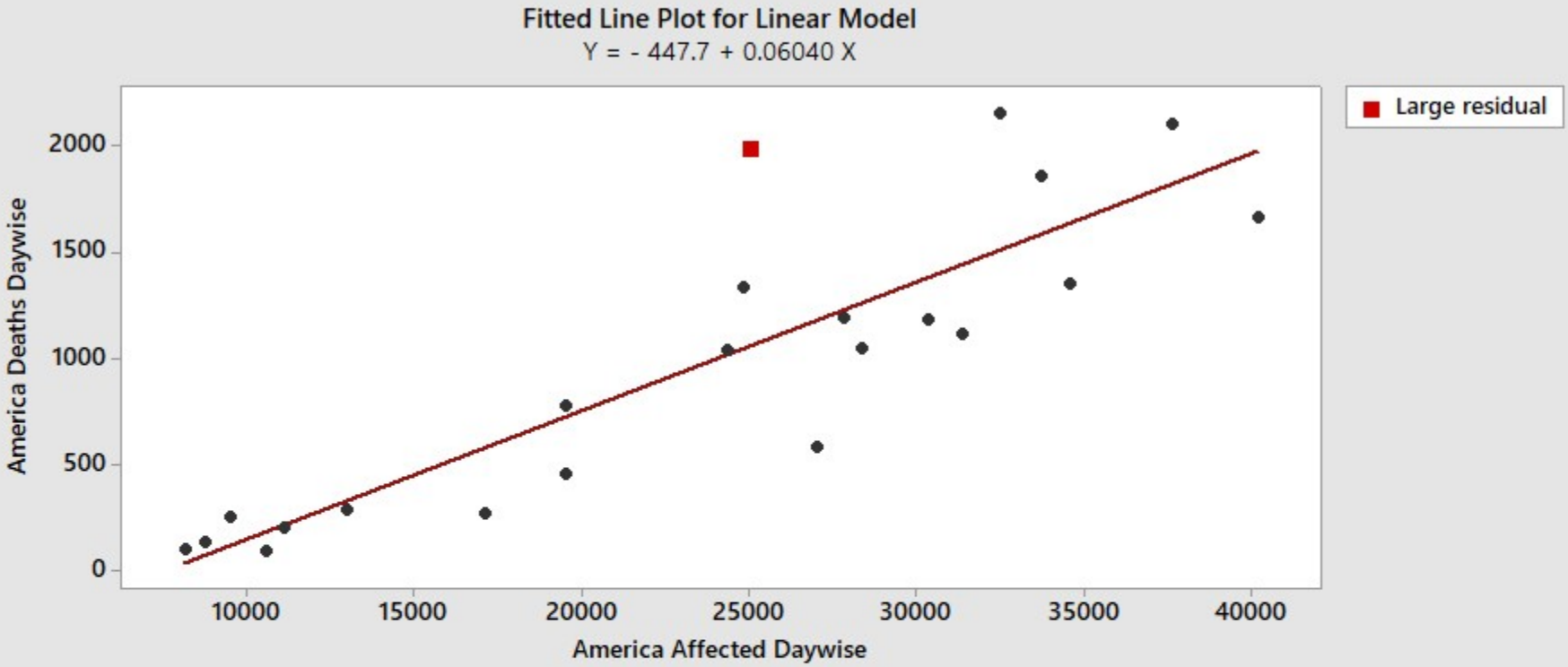


Thanks to "Thinathanthi" Tamil Daily in which Data was taken from 22 March to 13 April 2020

Analyzed by S.Lakshmanan, Psychologist

Regression for America Deaths Daywise vs America Affected Daywise
Model Selection Report

Y: America Deaths Daywise
X: America Affected Daywise



Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	74.67%	73.35%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	0.140
P-value, quadratic term	—	0.922
Residual standard deviation	348.963	357.936

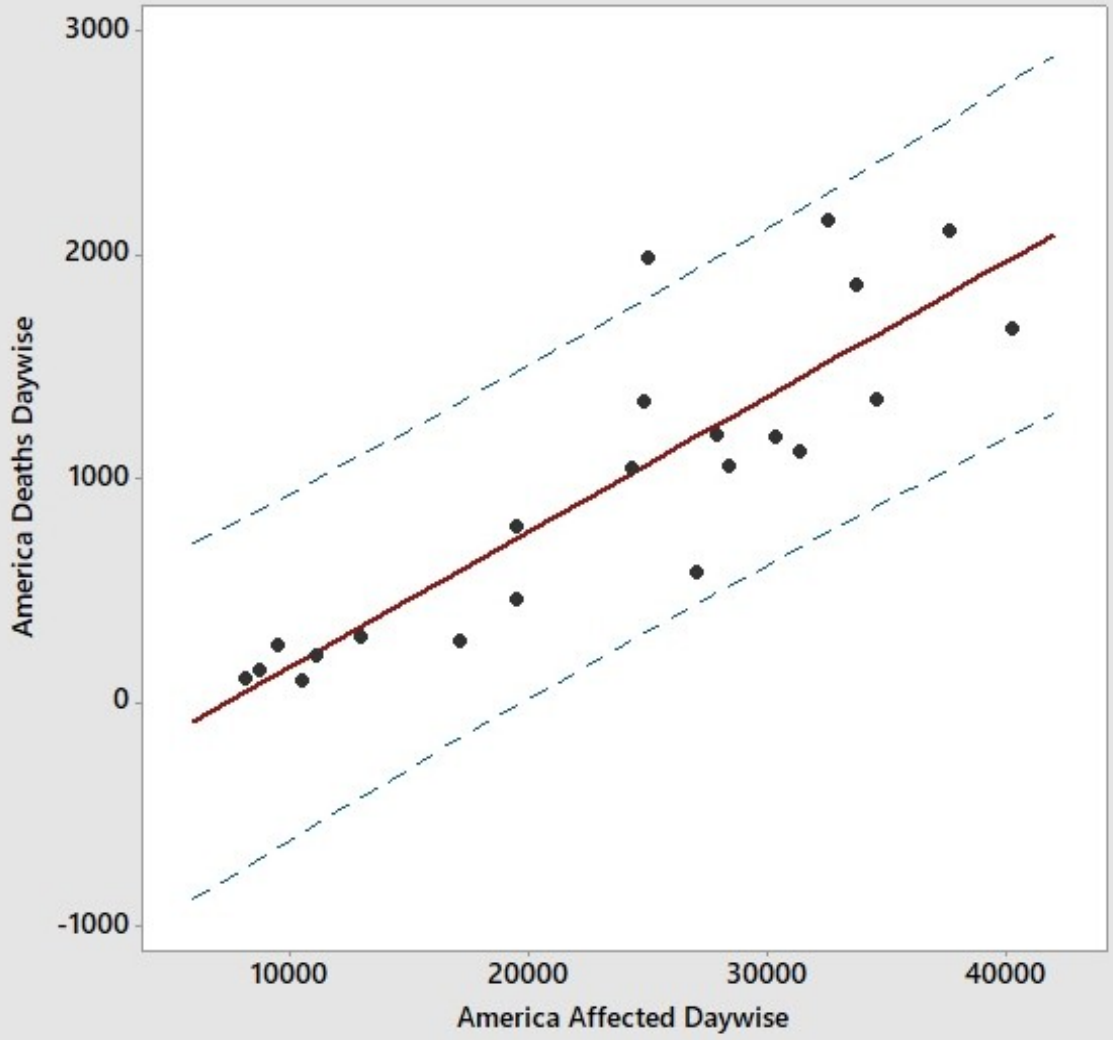
** Statistically significant ($p < 0.05$)*

Regression for America Deaths Daywise vs America Affected Daywise
Prediction Report

Y: America Deaths Daywise
X: America Affected Daywise

Prediction Plot

The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.

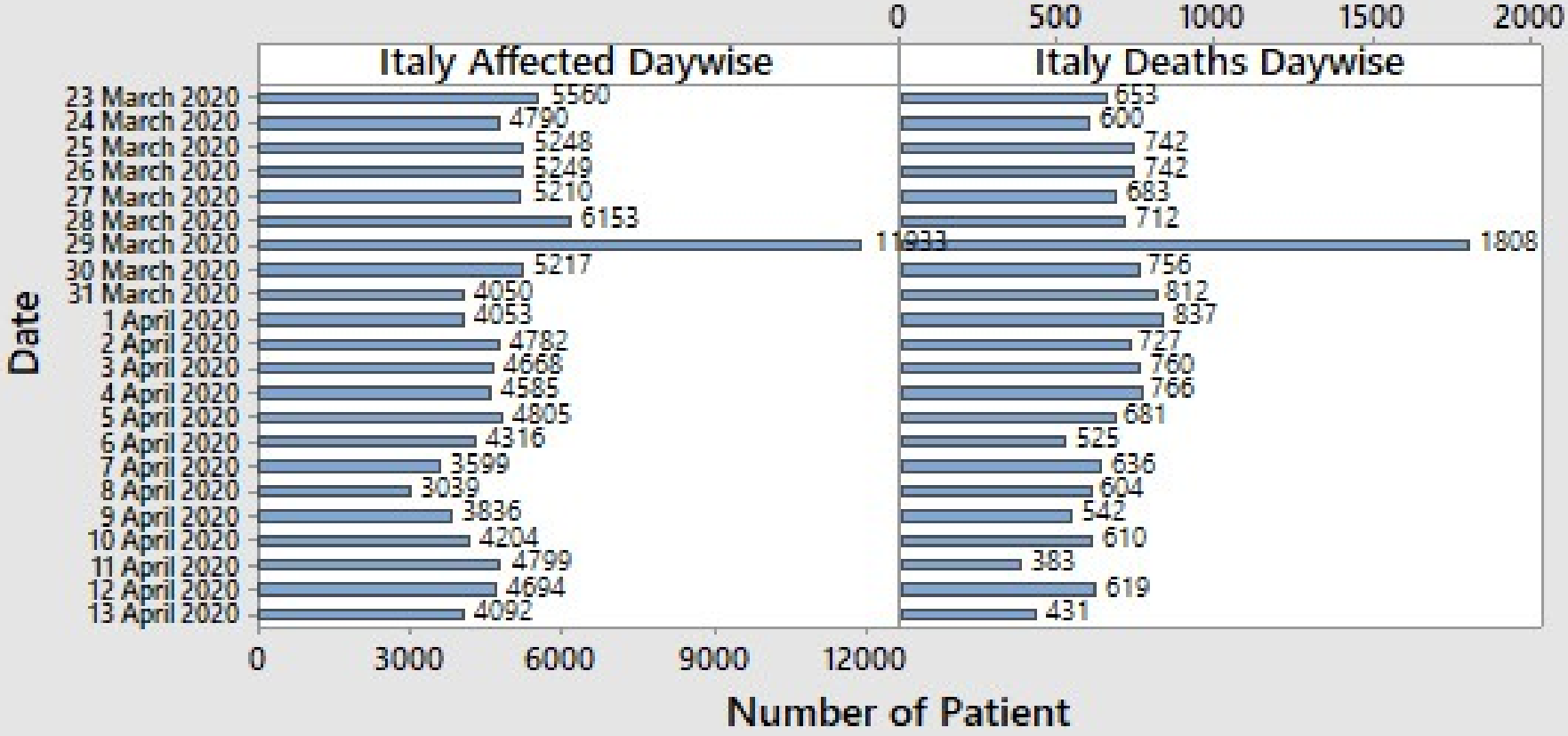


X	Predicted Y	95% PI
6000	-85.346	(-879.22, 708.52)
7500	5.2543	(-780.65, 791.15)
9000	95.854	(-682.72, 874.43)
10500	186.45	(-585.46, 958.37)
12000	277.05	(-488.89, 1043.0)
13500	367.65	(-393.02, 1128.3)
15000	458.25	(-297.86, 1214.4)
16500	548.85	(-203.43, 1301.1)
18000	639.45	(-109.73, 1388.6)
19500	730.05	(-16.786, 1476.9)
21000	820.65	(75.405, 1565.9)
22500	911.25	(166.84, 1655.7)
24000	1001.9	(257.51, 1746.2)
25500	1092.5	(347.41, 1837.5)
27000	1183.1	(436.56, 1929.5)
28500	1273.7	(524.95, 2022.4)
30000	1364.3	(612.59, 2115.9)
31500	1454.9	(699.50, 2210.2)
33000	1545.5	(785.67, 2305.2)
34500	1636.1	(871.12, 2401.0)
36000	1726.7	(955.88, 2497.4)
37500	1817.3	(1039.9, 2594.6)
39000	1907.9	(1123.3, 2692.4)
40500	1998.5	(1206.1, 2790.8)
42000	2089.1	(1288.2, 2889.9)

STATISTICAL PERSPECTIVE OF CORONA ATTACK IN ITALY

COVID-19

Stay home, Save lives



Thanks to "Thinathanthi" Tamil Daily in which Data was taken from 22 March to 13 April 2020

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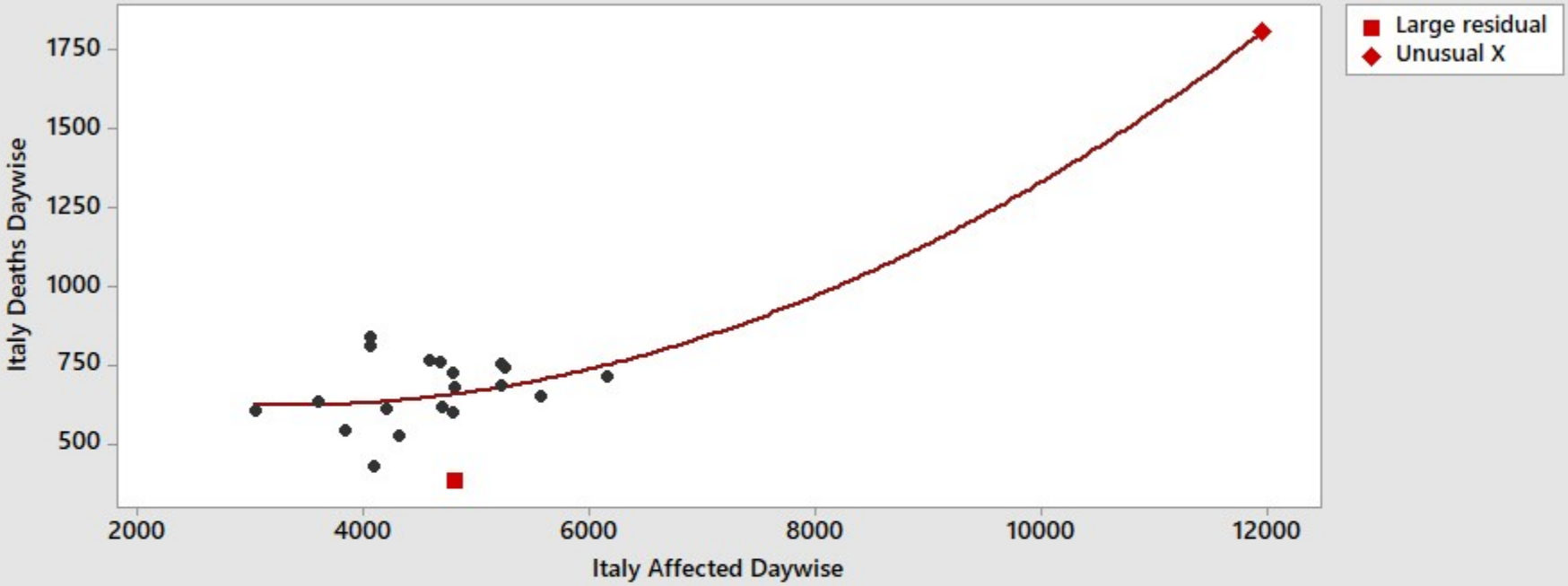
Regression for Italy Deaths Daywise vs Italy Affected Daywise
Model Selection Report

Y: Italy Deaths Daywise
X: Italy Affected Daywise

Fitted Line Plot for Quadratic Model
Y = 795.8 - 0.1047 X + 0.000016 X^2



Statistics	Selected Model Quadratic	Alternative Model Linear
R-squared (adjusted)	81.03%	74.00%
P-value, model	<0.005*	<0.005*
P-value, linear term	0.232	<0.005*
P-value, quadratic term	0.009*	—
Residual standard deviation	118.005	138.137

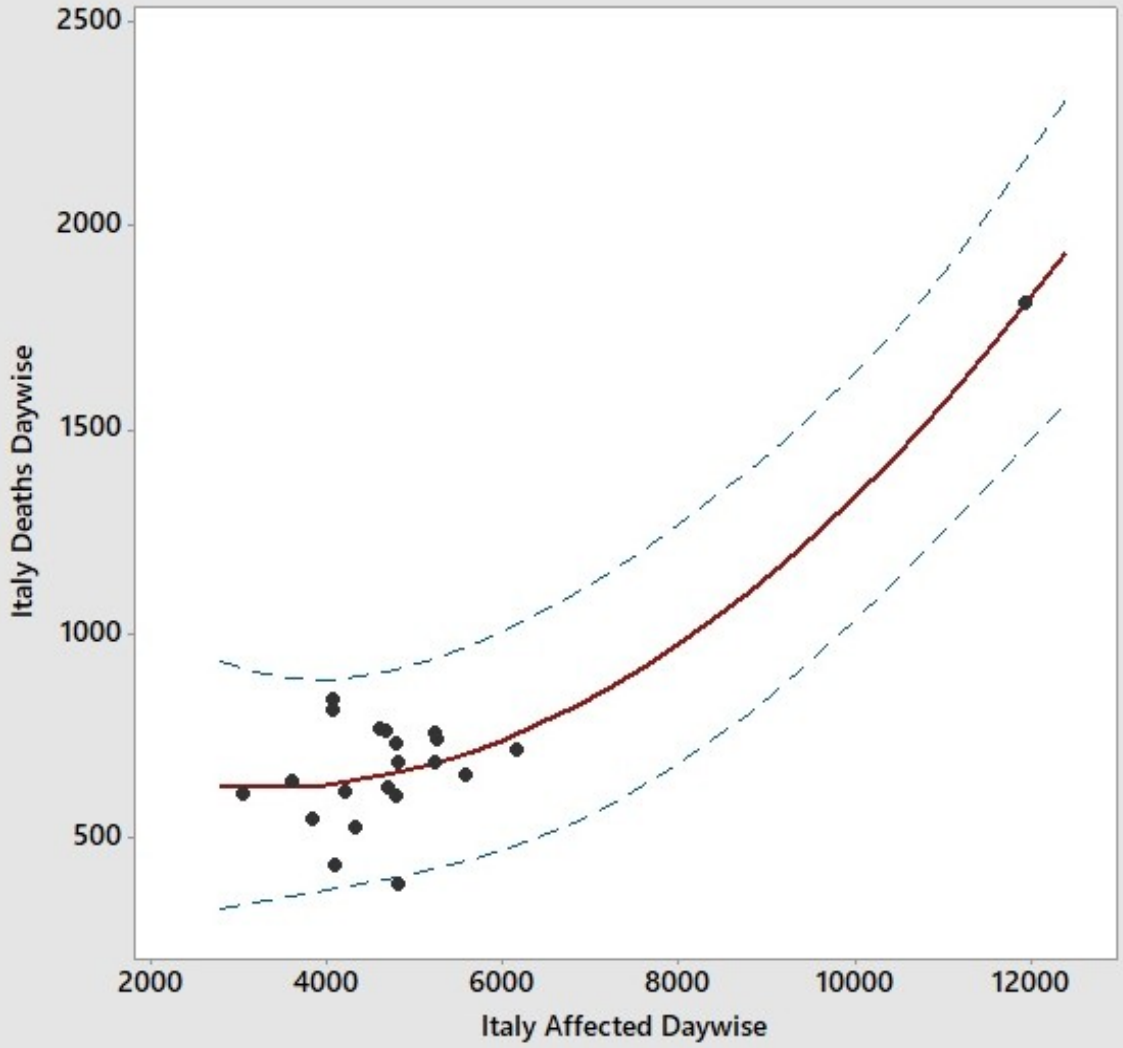
** Statistically significant ($p < 0.05$)*

Regression for Italy Deaths Daywise vs Italy Affected Daywise
Prediction Report

Y: Italy Deaths Daywise
X: Italy Affected Daywise

Prediction Plot

The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.

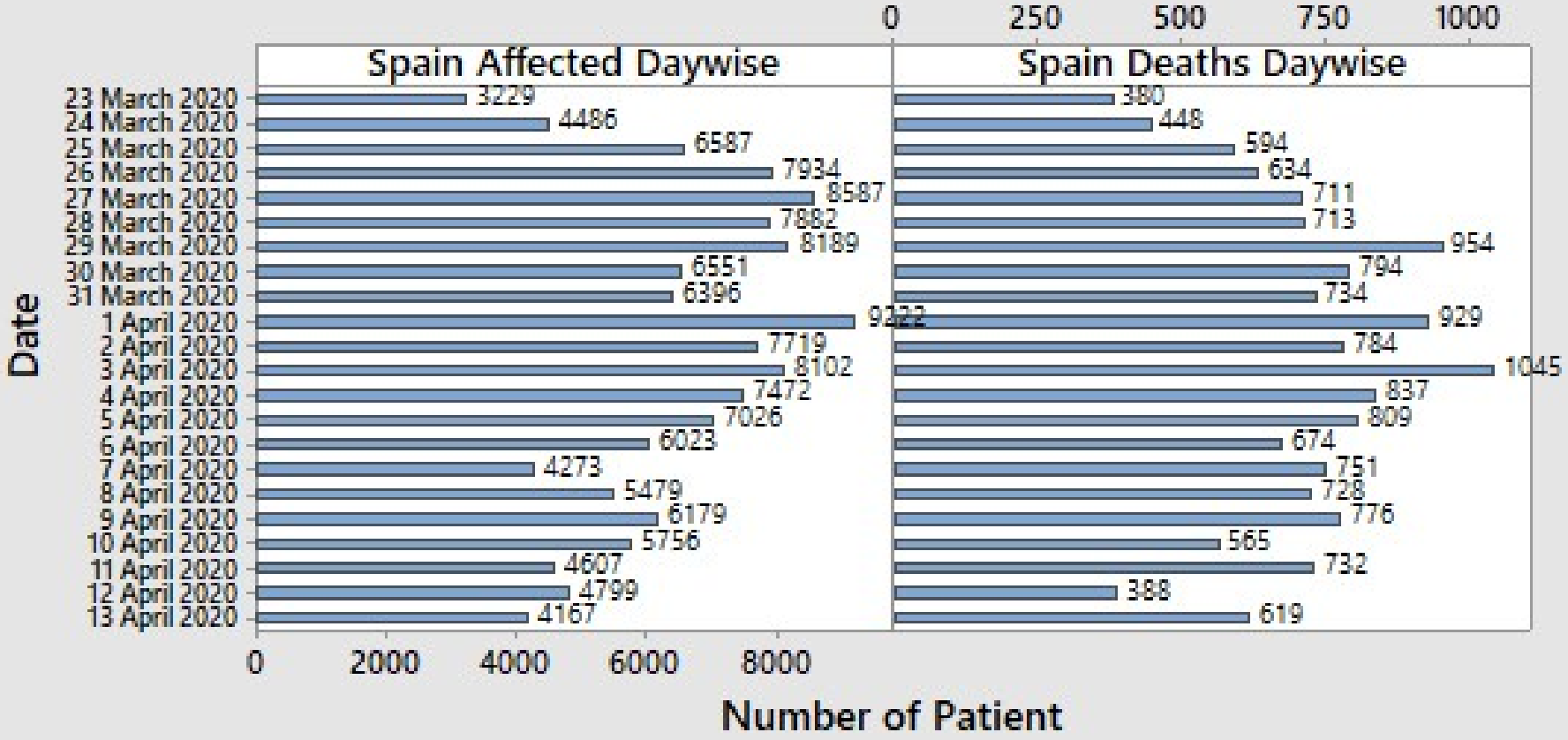


X	Predicted Y	95% PI
2800	626.96	(323.93, 929.99)
3200	623.15	(341.96, 904.35)
3600	624.43	(358.43, 890.43)
4000	630.78	(373.83, 887.74)
4400	642.22	(389.03, 895.41)
4800	658.73	(405.15, 912.31)
5200	680.32	(423.39, 937.25)
5600	706.99	(444.88, 969.09)
6000	738.73	(470.57, 1006.9)
6400	775.56	(501.18, 1049.9)
6800	817.46	(537.24, 1097.7)
7200	864.45	(579.09, 1149.8)
7600	916.51	(626.92, 1206.1)
8000	973.65	(680.76, 1266.5)
8400	1035.9	(740.53, 1331.2)
8800	1103.2	(806.01, 1400.3)
9200	1175.5	(876.86, 1474.2)
9600	1253.0	(952.63, 1553.3)
10000	1335.5	(1032.7, 1638.3)
10400	1423.1	(1116.4, 1729.8)
10800	1515.8	(1203.0, 1828.6)
11200	1613.6	(1291.6, 1935.5)
11600	1716.4	(1381.6, 2051.3)
12000	1824.3	(1472.1, 2176.6)
12400	1937.4	(1562.8, 2311.9)

STATISTICAL PERSPECTIVE OF CORONA ATTACK IN SPAIN

COVID-19

Stay home, Save lives



Thanks to "Thinathanthi" Tamil Daily in which Data was taken from 22 March to 13 April 2020

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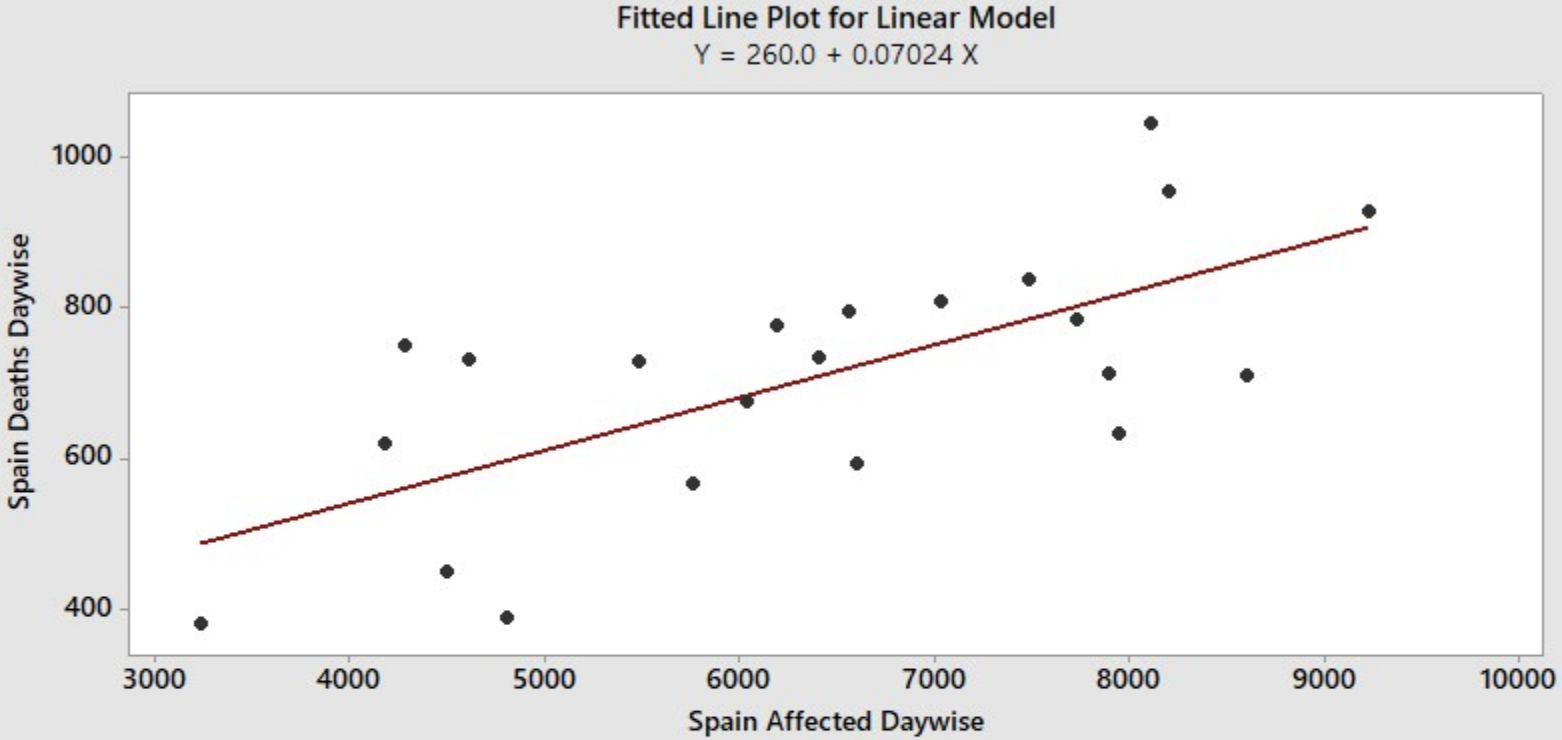
Regression for Spain Deaths Daywise vs Spain Affected Daywise
Model Selection Report

Y: Spain Deaths Daywise
X: Spain Affected Daywise



Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	44.65%	42.09%
P-value, model	<0.005*	0.002*
P-value, linear term	<0.005*	0.400
P-value, quadratic term	—	0.736
Residual standard deviation	125.402	128.266

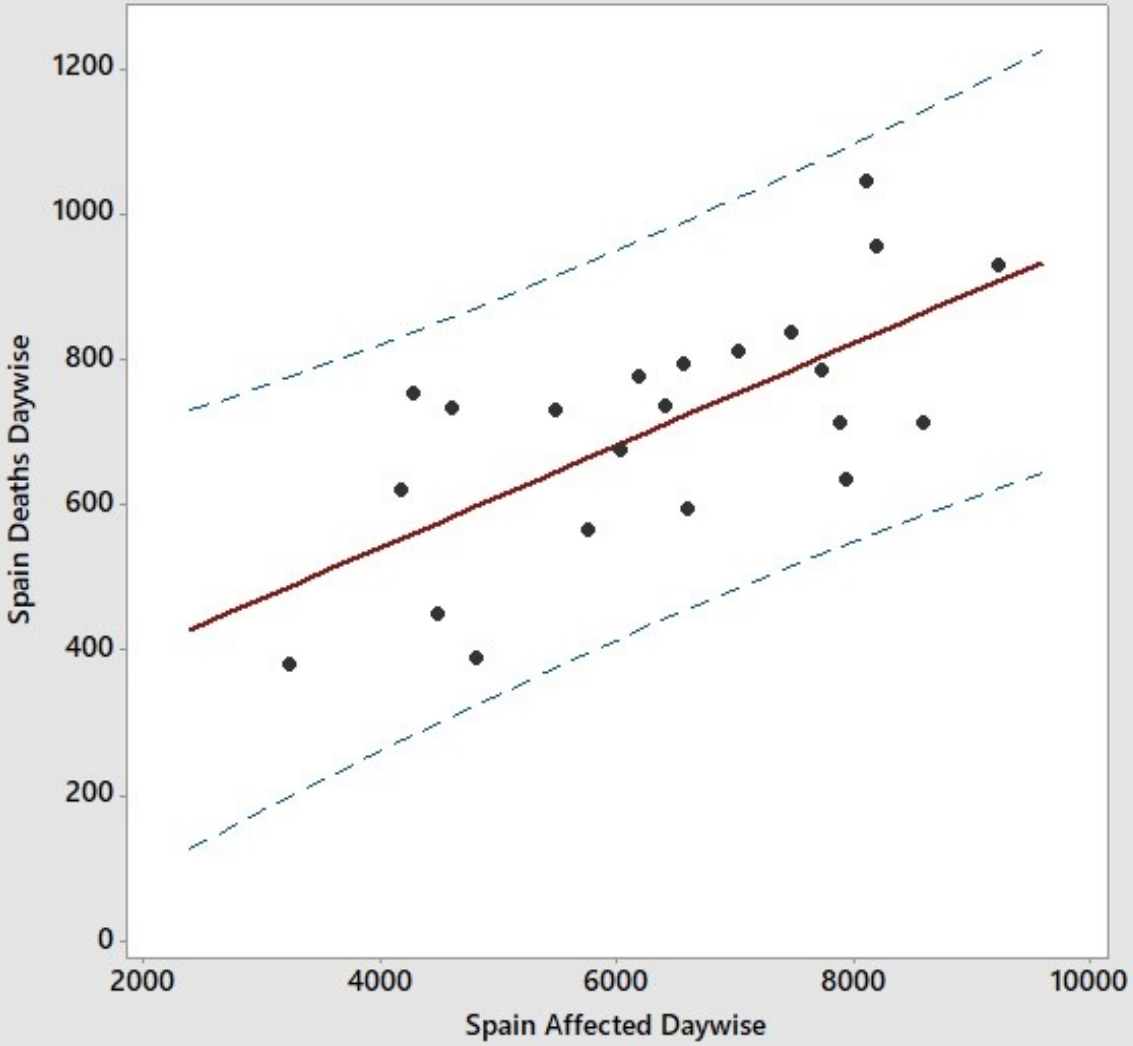
** Statistically significant ($p < 0.05$)*

Regression for Spain Deaths Daywise vs Spain Affected Daywise
Prediction Report

Y: Spain Deaths Daywise
X: Spain Affected Daywise

Prediction Plot

The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.

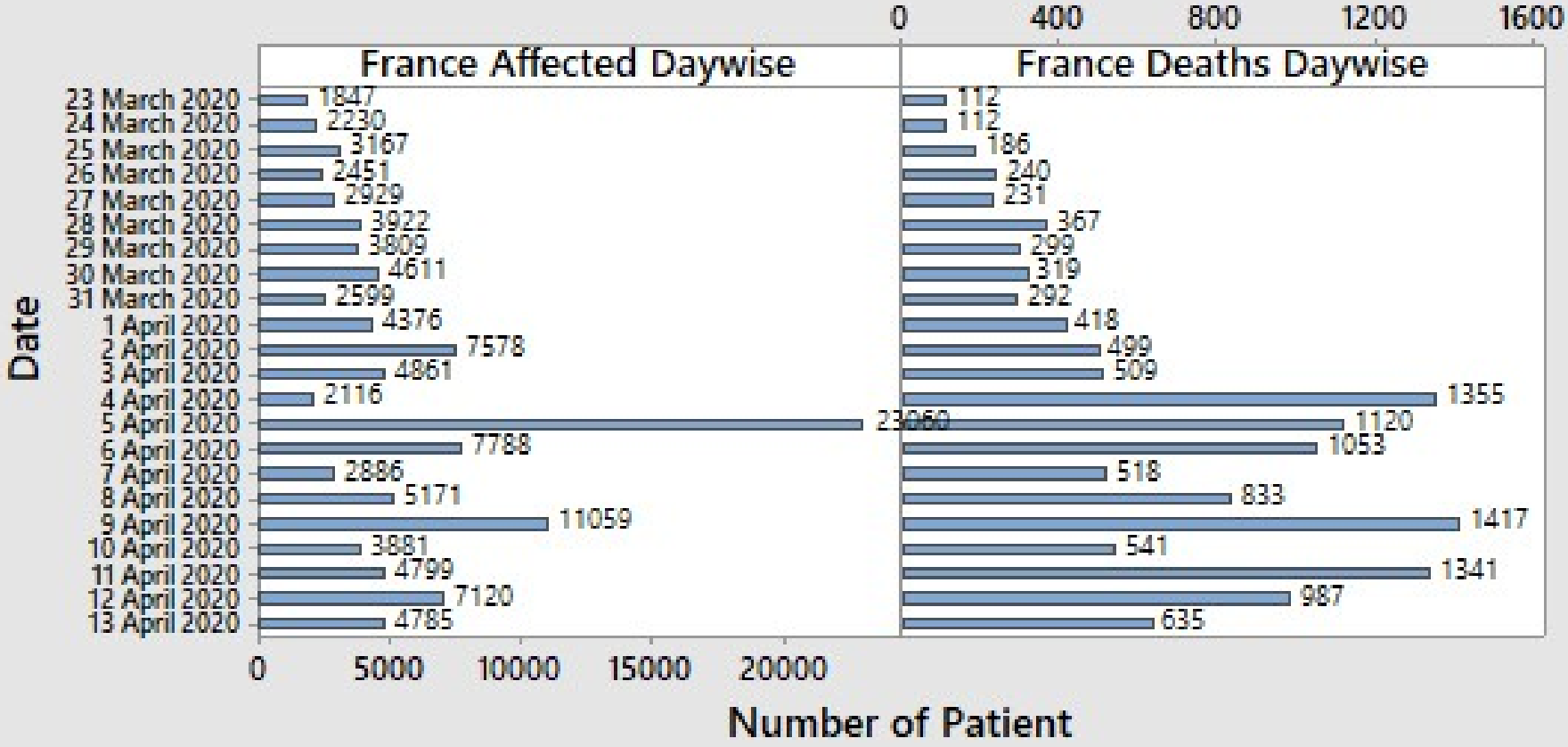


X	Predicted Y	95% PI
2400	428.53	(127.50, 729.56)
2700	449.60	(153.19, 746.02)
3000	470.67	(178.58, 762.76)
3300	491.74	(203.66, 779.82)
3600	512.81	(228.43, 797.20)
3900	533.88	(252.85, 814.91)
4200	554.96	(276.93, 832.98)
4500	576.03	(300.66, 851.40)
4800	597.10	(324.01, 870.18)
5100	618.17	(346.99, 889.35)
5400	639.24	(369.58, 908.90)
5700	660.31	(391.77, 928.85)
6000	681.38	(413.57, 949.19)
6300	702.45	(434.97, 969.94)
6600	723.52	(455.96, 991.08)
6900	744.59	(476.56, 1012.6)
7200	765.67	(496.75, 1034.6)
7500	786.74	(516.55, 1056.9)
7800	807.81	(535.96, 1079.7)
8100	828.88	(554.98, 1102.8)
8400	849.95	(573.63, 1126.3)
8700	871.02	(591.92, 1150.1)
9000	892.09	(609.85, 1174.3)
9300	913.16	(627.43, 1198.9)
9600	934.23	(644.69, 1223.8)

STATISTICAL PERSPECTIVE OF CORONA ATTACK IN FRANCE

COVID-19

Stay home, Save lives



Thanks to "Thinathanthi" Tamil Daily in which Data was taken from 22 March to 13 April 2020

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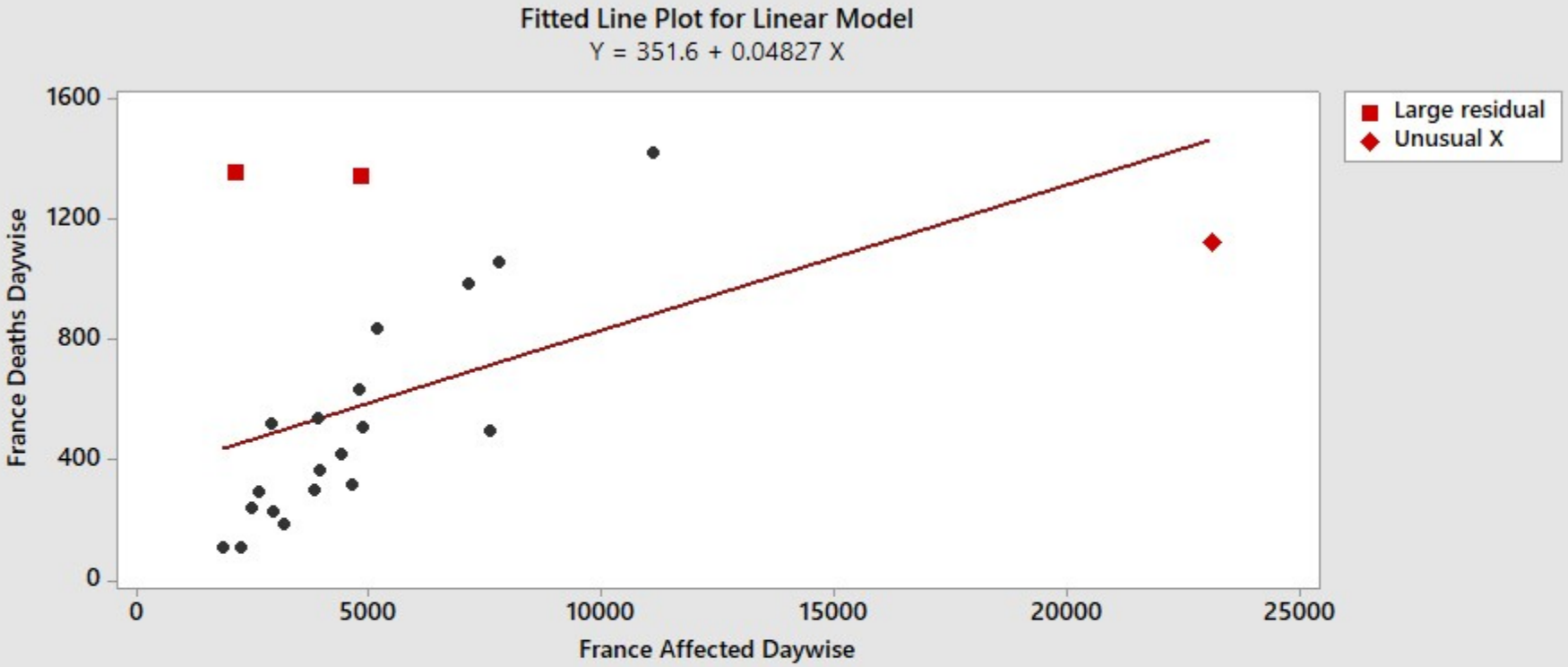
Regression for France Deaths Daywise vs France Affected Daywise
Model Selection Report

Y: France Deaths Daywise
X: France Affected Daywise



Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	23.26%	32.39%
P-value, model	0.013*	0.009*
P-value, linear term	0.013*	0.016*
P-value, quadratic term	—	0.070
Residual standard deviation	370.664	347.926

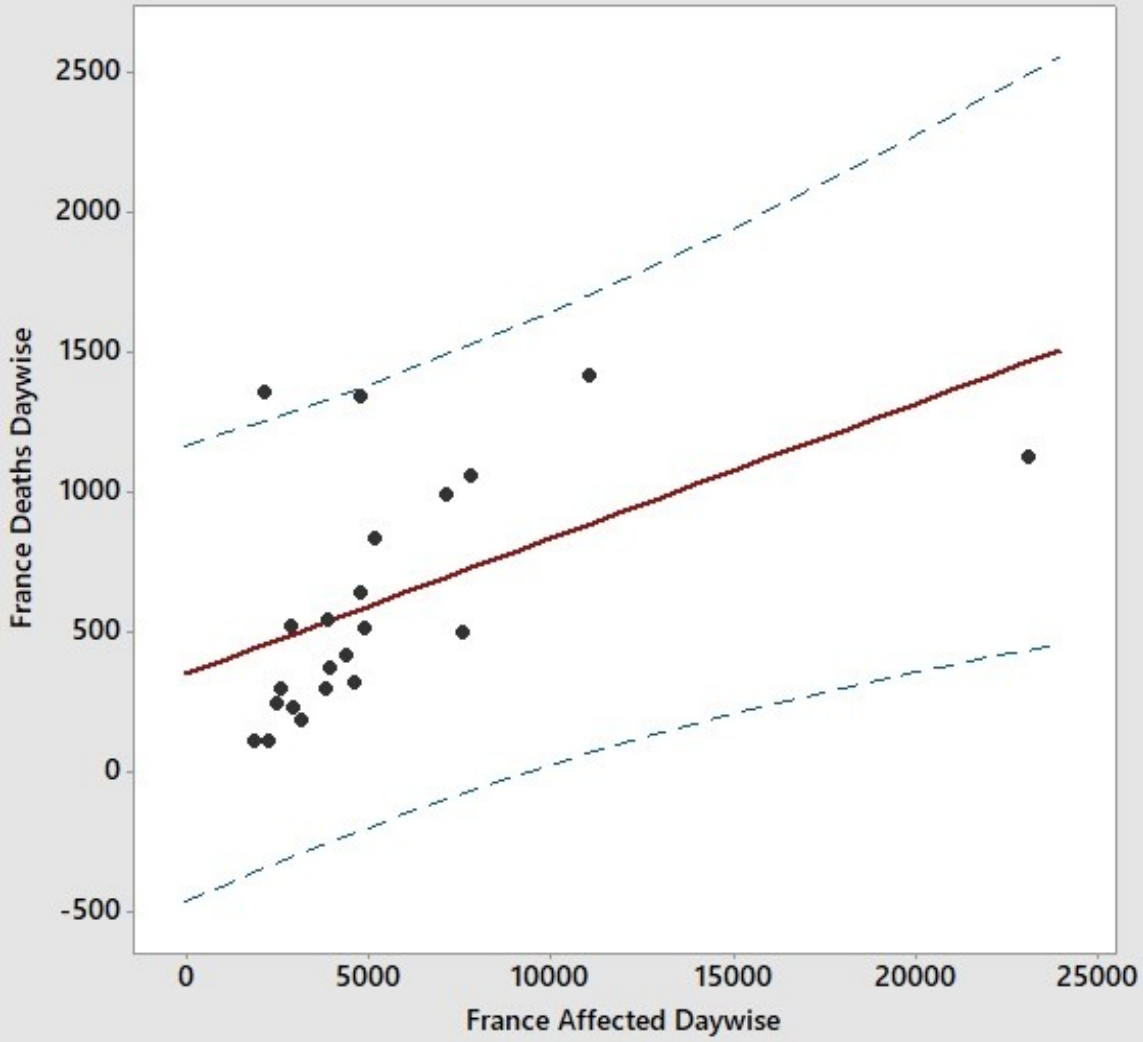
** Statistically significant ($p < 0.05$)*

Regression for France Deaths Daywise vs France Affected Daywise
Prediction Report

Y: France Deaths Daywise
X: France Affected Daywise

Prediction Plot

The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



X	Predicted Y	95% PI
0	351.55	(-463.28, 1166.4)
1000	399.82	(-406.83, 1206.5)
2000	448.09	(-352.01, 1248.2)
3000	496.36	(-298.88, 1291.6)
4000	544.63	(-247.45, 1336.7)
5000	592.91	(-197.75, 1383.6)
6000	641.18	(-149.79, 1432.1)
7000	689.45	(-103.57, 1482.5)
8000	737.72	(-59.077, 1534.5)
9000	785.99	(-16.279, 1588.3)
10000	834.26	(24.853, 1643.7)
11000	882.53	(64.363, 1700.7)
12000	930.80	(102.30, 1759.3)
13000	979.07	(138.73, 1819.4)
14000	1027.3	(173.71, 1881.0)
15000	1075.6	(207.31, 1943.9)
16000	1123.9	(239.59, 2008.2)
17000	1172.2	(270.63, 2073.7)
18000	1220.4	(300.49, 2140.4)
19000	1268.7	(329.25, 2208.1)
20000	1317.0	(356.97, 2277.0)
21000	1365.2	(383.72, 2346.8)
22000	1413.5	(409.56, 2417.5)
23000	1461.8	(434.55, 2489.0)
24000	1510.1	(458.74, 2561.4)

STATISTICAL PERSPECTIVE OF CORONA ATTACK IN IRAN

COVID-19

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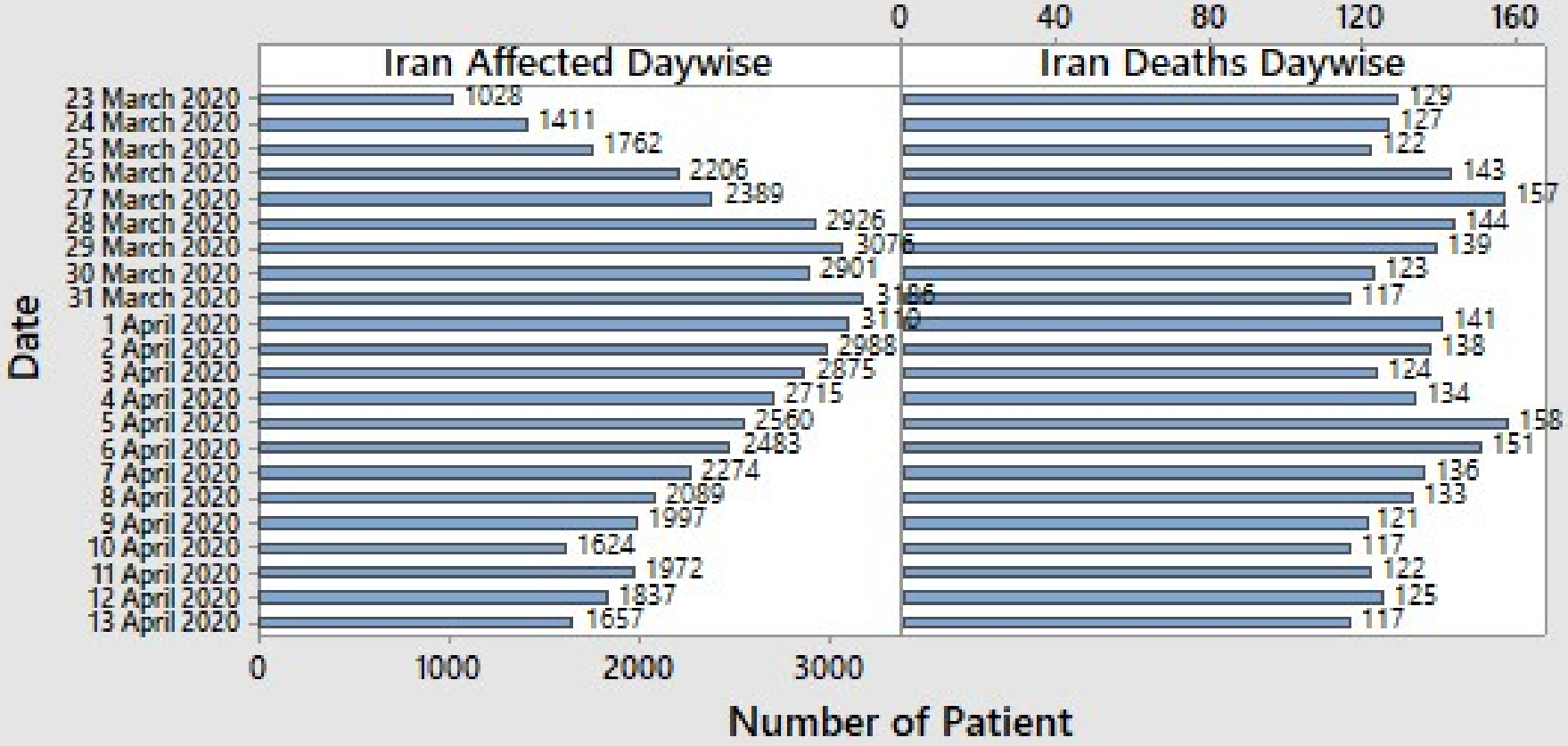
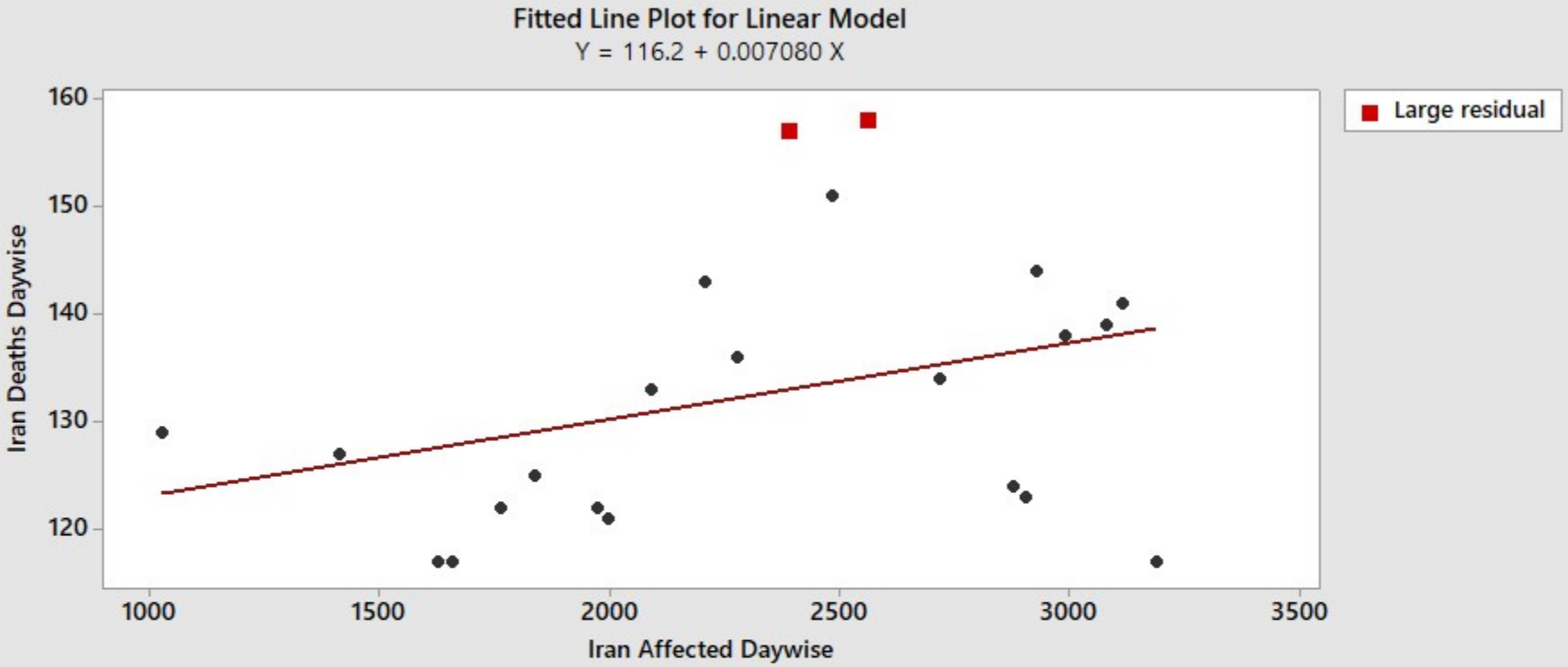


Thanks to "Thinathanthi" Tamil Daily in which Data was taken from 22 March to 13 April 2020

Analyzed by S.Lakshmanan, Psychologist

Regression for Iran Deaths Daywise vs Iran Affected Daywise
Model Selection Report

Y: Iran Deaths Daywise
X: Iran Affected Daywise



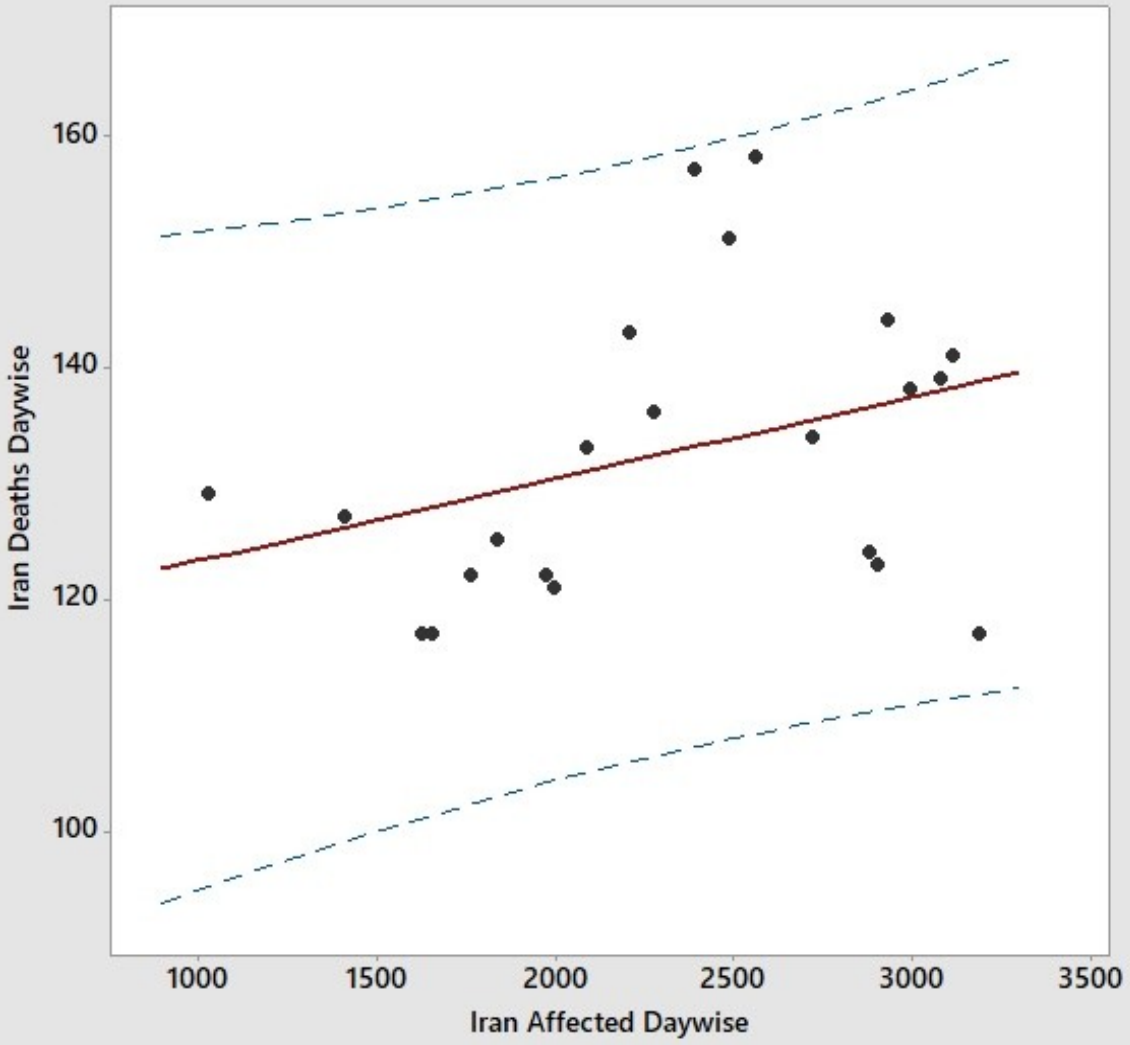
Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	7.50%	8.69%
P-value, model	0.116	0.163
P-value, linear term	0.116	0.198
P-value, quadratic term	—	0.275
Residual standard deviation	12.109	12.031

Regression for Iran Deaths Daywise vs Iran Affected Daywise
Prediction Report

Y: Iran Deaths Daywise
X: Iran Affected Daywise

Prediction Plot

The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.

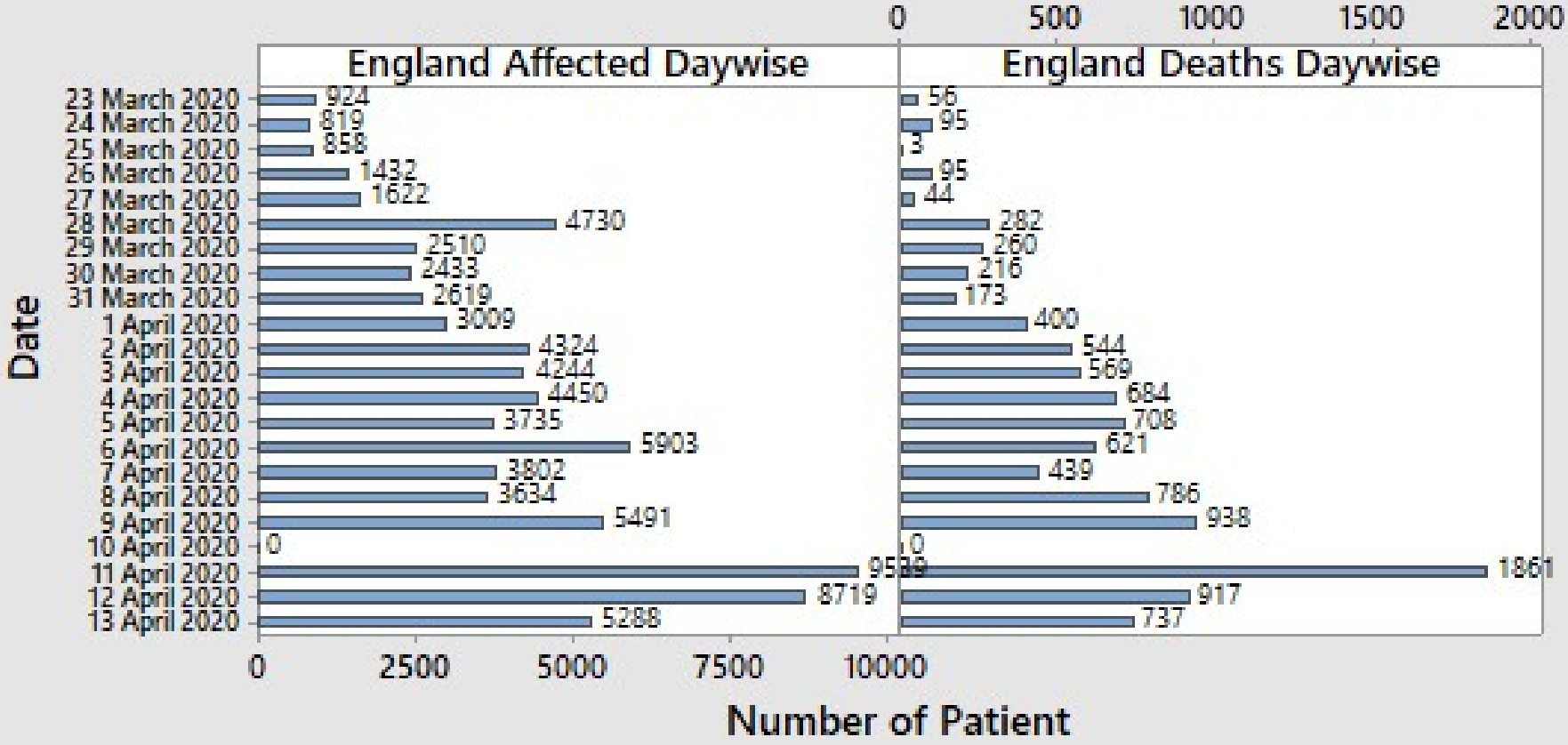


X	Predicted Y	95% PI
900	122.57	(93.764, 151.38)
1000	123.28	(94.859, 151.71)
1100	123.99	(95.930, 152.05)
1200	124.70	(96.977, 152.42)
1300	125.41	(97.998, 152.81)
1400	126.11	(98.994, 153.23)
1500	126.82	(99.962, 153.68)
1600	127.53	(100.90, 154.16)
1700	128.24	(101.82, 154.66)
1800	128.95	(102.70, 155.19)
1900	129.65	(103.55, 155.76)
2000	130.36	(104.37, 156.35)
2100	131.07	(105.17, 156.97)
2200	131.78	(105.93, 157.63)
2300	132.49	(106.66, 158.31)
2400	133.19	(107.36, 159.03)
2500	133.90	(108.03, 159.78)
2600	134.61	(108.66, 160.56)
2700	135.32	(109.27, 161.37)
2800	136.03	(109.84, 162.21)
2900	136.73	(110.39, 163.08)
3000	137.44	(110.91, 163.98)
3100	138.15	(111.39, 164.91)
3200	138.86	(111.85, 165.87)
3300	139.57	(112.28, 166.85)

STATISTICAL PERSPECTIVE OF CORONA ATTACK IN ENGLAND

COVID-19

Stay home, Save lives

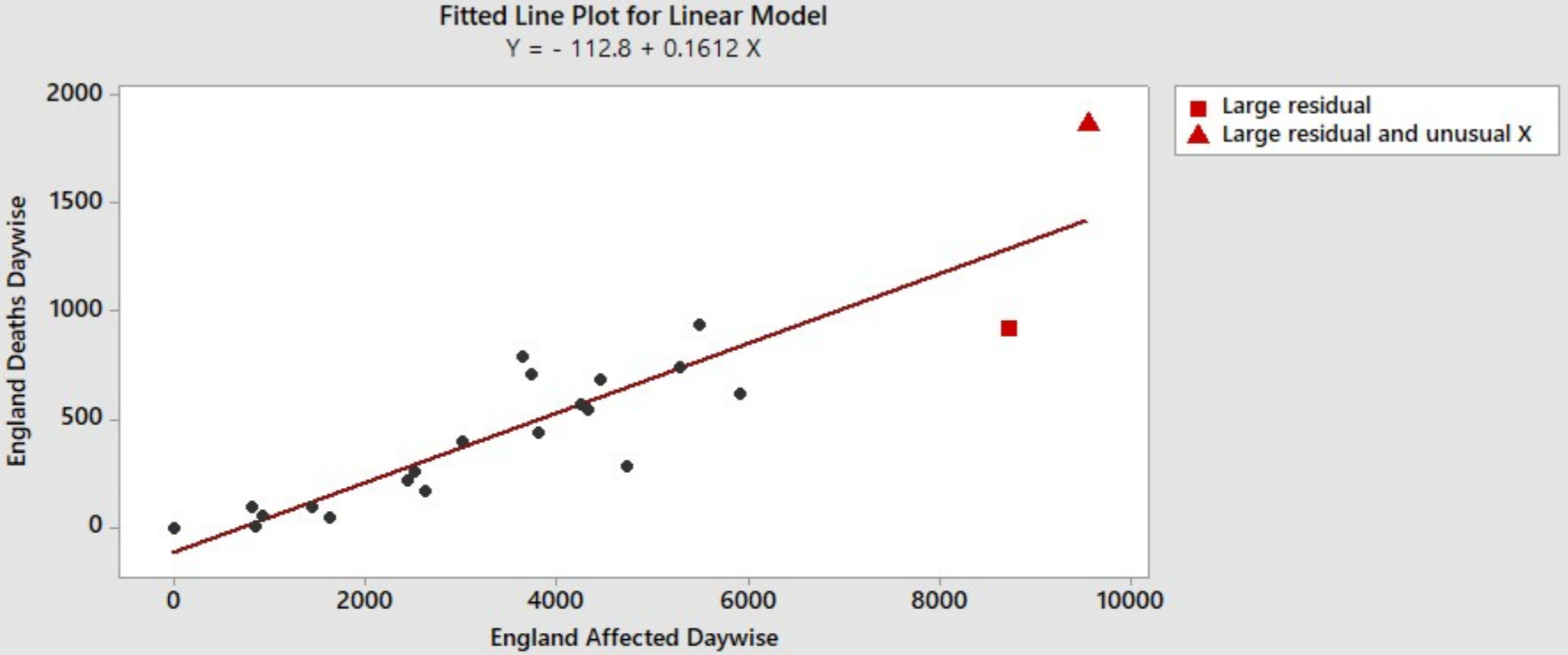


Thanks to "Thinathanthi" Tamil Daily in which Data was taken from 22 March to 13 April 2020

Analyzed by S.Lakshmanan, Psychologist

Regression for England Deaths Daywise vs England Affected Daywise
Model Selection Report

Y: England Deaths Daywise
X: England Affected Daywise



Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	80.09%	79.81%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	0.042*
P-value, quadratic term	—	0.405
Residual standard deviation	194.182	195.537

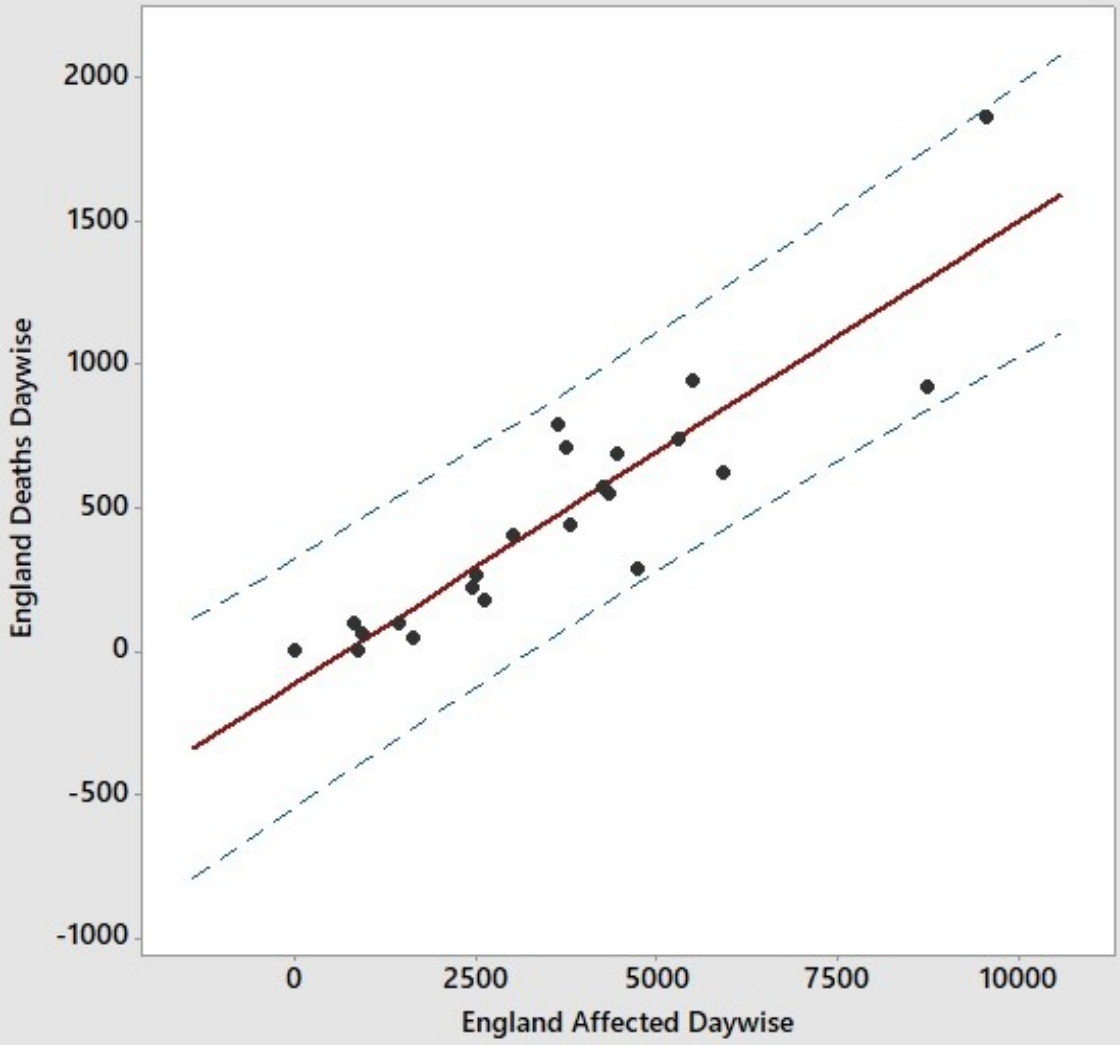
** Statistically significant ($p < 0.05$)*

Regression for England Deaths Daywise vs England Affected Daywise
Prediction Report

Y: England Deaths Daywise
X: England Affected Daywise

Prediction Plot

The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



X	Predicted Y	95% PI
-1400	-338.41	(-791.33, 114.51)
-900	-257.82	(-703.69, 188.05)
-400	-177.23	(-616.69, 262.23)
100	-96.635	(-530.35, 337.08)
600	-16.042	(-444.71, 412.63)
1100	64.551	(-359.79, 488.89)
1600	145.14	(-275.61, 565.90)
2100	225.74	(-192.19, 643.67)
2600	306.33	(-109.55, 722.21)
3100	386.92	(-27.702, 801.55)
3600	467.52	(53.354, 881.68)
4100	548.11	(133.61, 962.61)
4600	628.70	(213.07, 1044.3)
5100	709.29	(291.75, 1126.8)
5600	789.89	(369.64, 1210.1)
6100	870.48	(446.77, 1294.2)
6600	951.07	(523.15, 1379.0)
7100	1031.7	(598.81, 1464.5)
7600	1112.3	(673.77, 1550.7)
8100	1192.9	(748.06, 1637.6)
8600	1273.4	(821.70, 1725.2)
9100	1354.0	(894.73, 1813.3)
9600	1434.6	(967.17, 1902.1)
10100	1515.2	(1039.1, 1991.4)
10600	1595.8	(1110.4, 2081.2)

STATISTICAL PERSPECTIVE OF CORONA ATTACK IN INDIA

COVID-19

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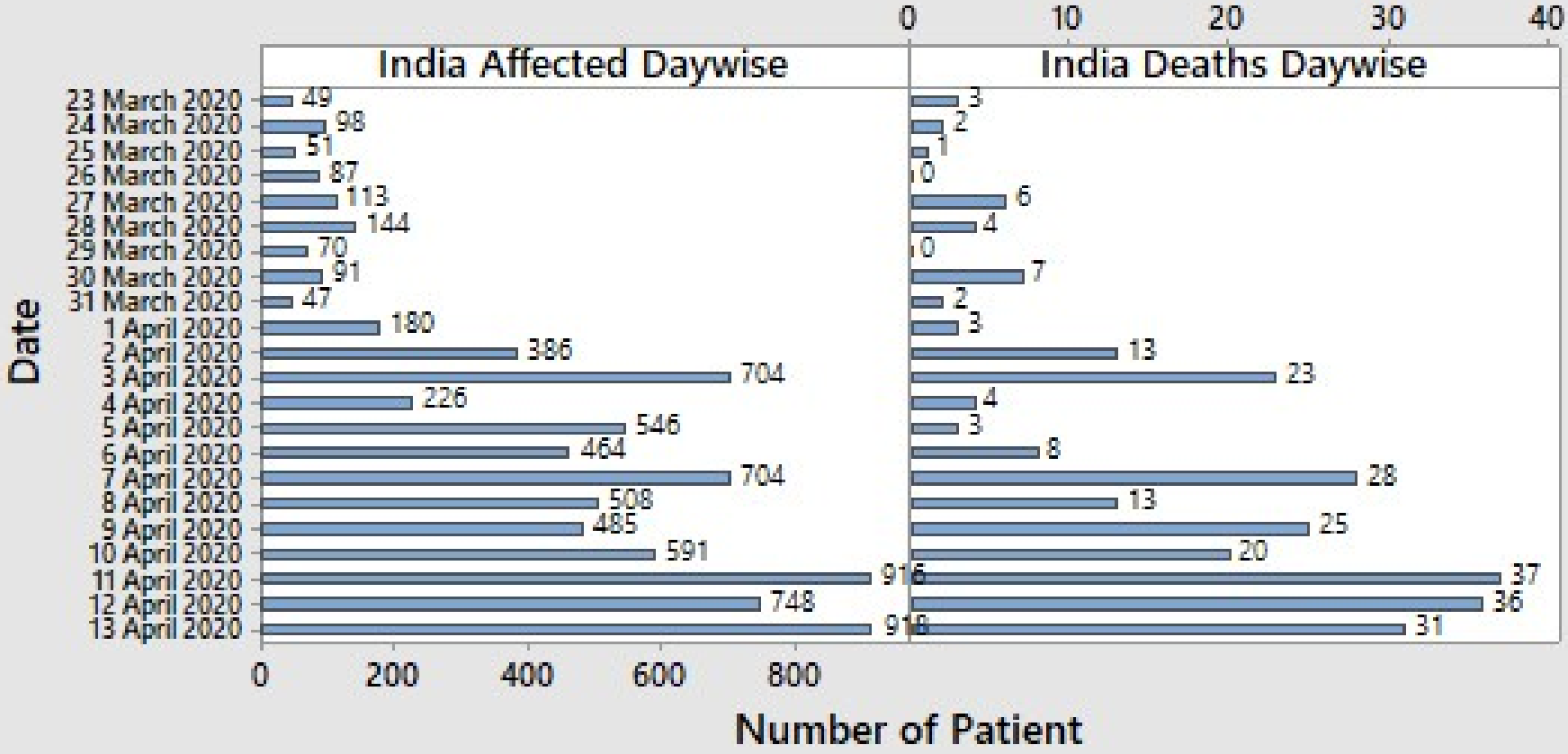


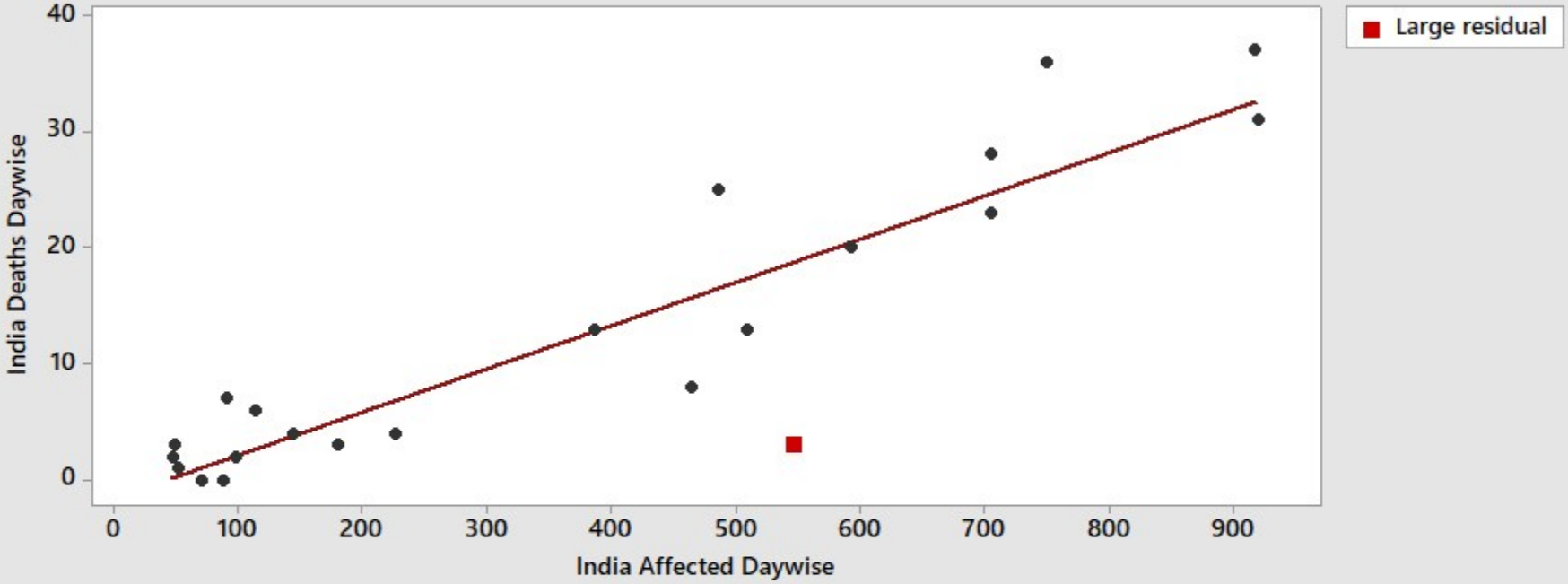
Thanks to "Thinathanthi" Tamil Daily in which Data was taken from 22 March to 13 April 2020

Analyzed by S.Lakshmanan, Psychologist

Regression for India Deaths Daywise vs India Affected Daywise
Model Selection Report

Y: India Deaths Daywise
X: India Affected Daywise

Fitted Line Plot for Linear Model
Y = - 1.559 + 0.03732 X



Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	80.62%	81.89%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	0.341
P-value, quadratic term	—	0.138
Residual standard deviation	5.460	5.278

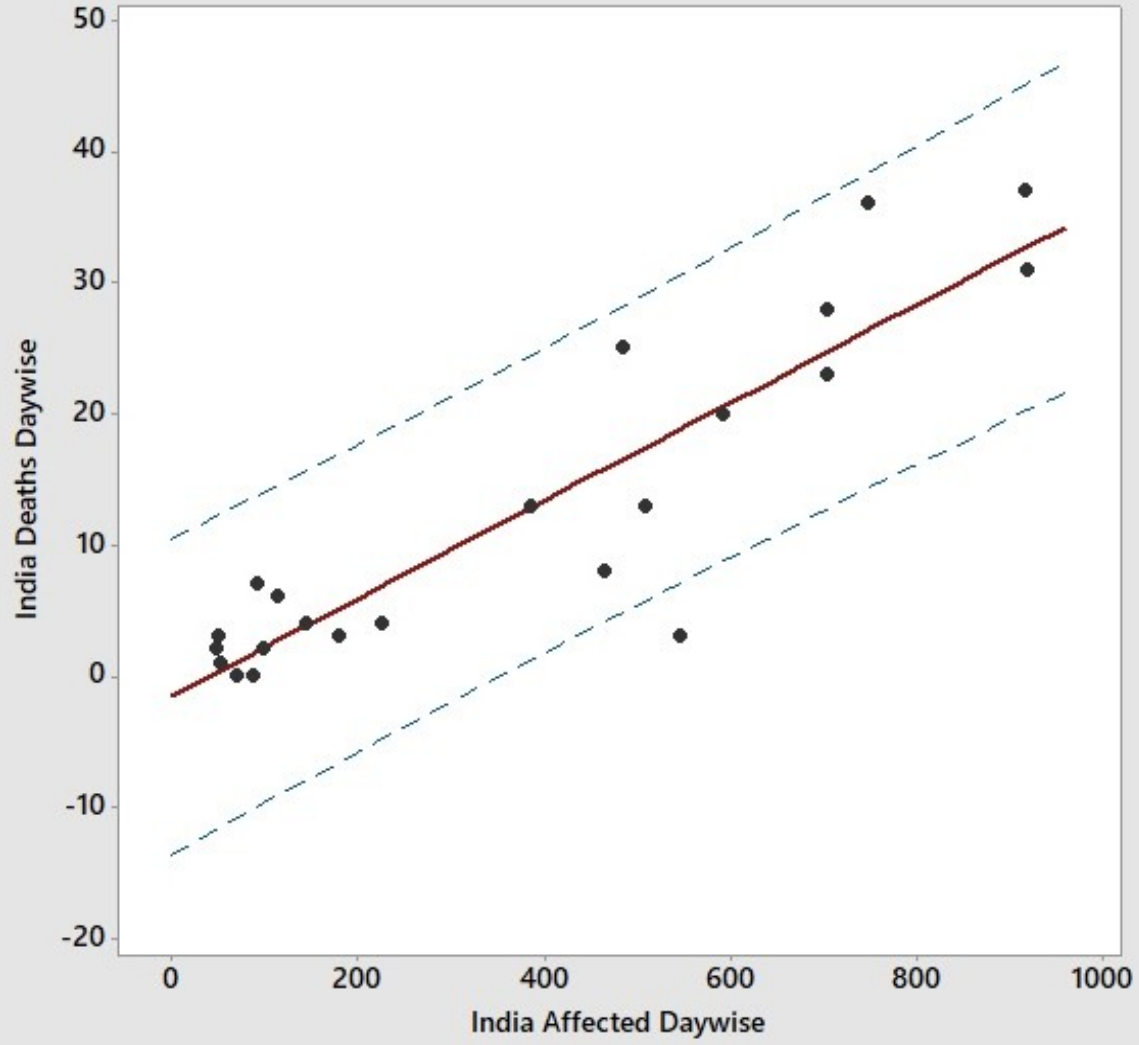
** Statistically significant ($p < 0.05$)*

Regression for India Deaths Daywise vs India Affected Daywise
Prediction Report

Y: India Deaths Daywise
X: India Affected Daywise

Prediction Plot

The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.

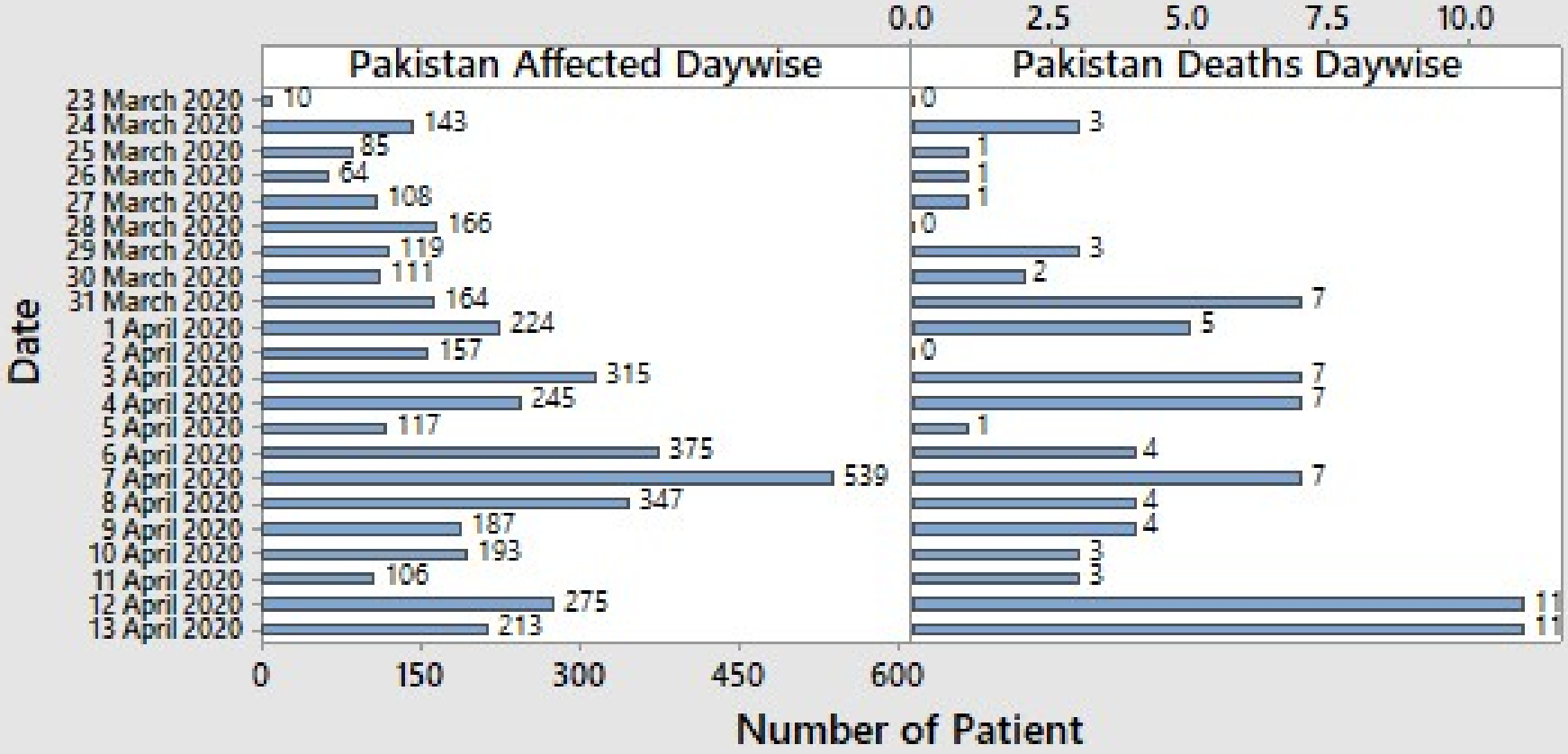


X	Predicted Y	95% PI
0	-1.5586	(-13.599, 10.482)
40	-0.06568	(-12.026, 11.895)
80	1.4273	(-10.462, 13.316)
120	2.9202	(-8.9067, 14.747)
160	4.4131	(-7.3604, 16.187)
200	5.9061	(-5.8233, 17.635)
240	7.3990	(-4.2953, 19.093)
280	8.8919	(-2.7767, 20.561)
320	10.385	(-1.2674, 22.037)
360	11.878	(0.23242, 23.523)
400	13.371	(1.7228, 25.019)
440	14.864	(3.2039, 26.523)
480	16.357	(4.6755, 28.038)
520	17.850	(6.1378, 29.561)
560	19.342	(7.5908, 31.094)
600	20.835	(9.0346, 32.636)
640	22.328	(10.469, 34.187)
680	23.821	(11.895, 35.747)
720	25.314	(13.312, 37.316)
760	26.807	(14.721, 38.893)
800	28.300	(16.121, 40.479)
840	29.793	(17.513, 42.073)
880	31.286	(18.896, 43.675)
920	32.779	(20.272, 45.285)
960	34.272	(21.641, 46.903)

STATISTICAL PERSPECTIVE OF CORONA ATTACK IN PAKISTAN

COVID-19

Stay home, Save lives



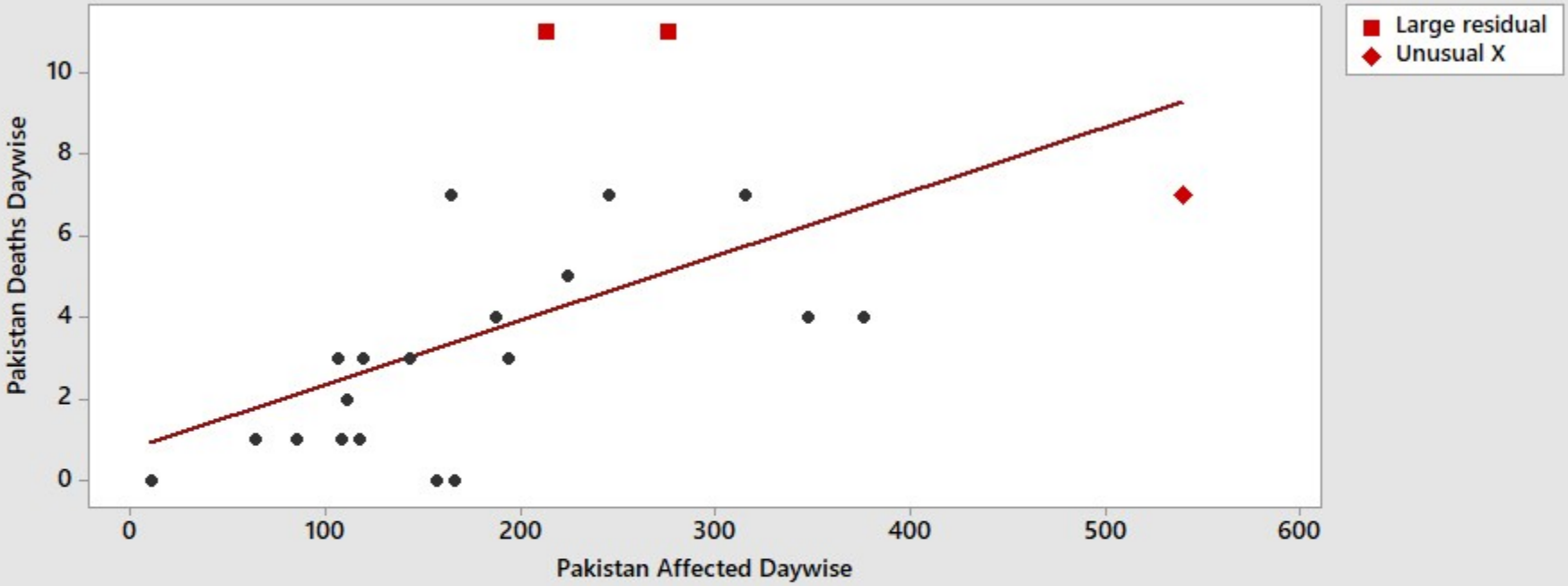
Thanks to "Thinathanthi" Tamil Daily in which Data was taken from 22 March to 13 April 2020

Analyzed by S.Lakshmanan, Psychologist

Regression for Pakistan Deaths Daywise vs Pakistan Affected Daywise
Model Selection Report

Y: Pakistan Deaths Daywise
X: Pakistan Affected Daywise

Fitted Line Plot for Linear Model
Y = 0.803 + 0.01580 X



Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	29.94%	37.41%
P-value, model	0.005*	0.005*
P-value, linear term	0.005*	0.012*
P-value, quadratic term	—	0.081
Residual standard deviation	2.749	2.599

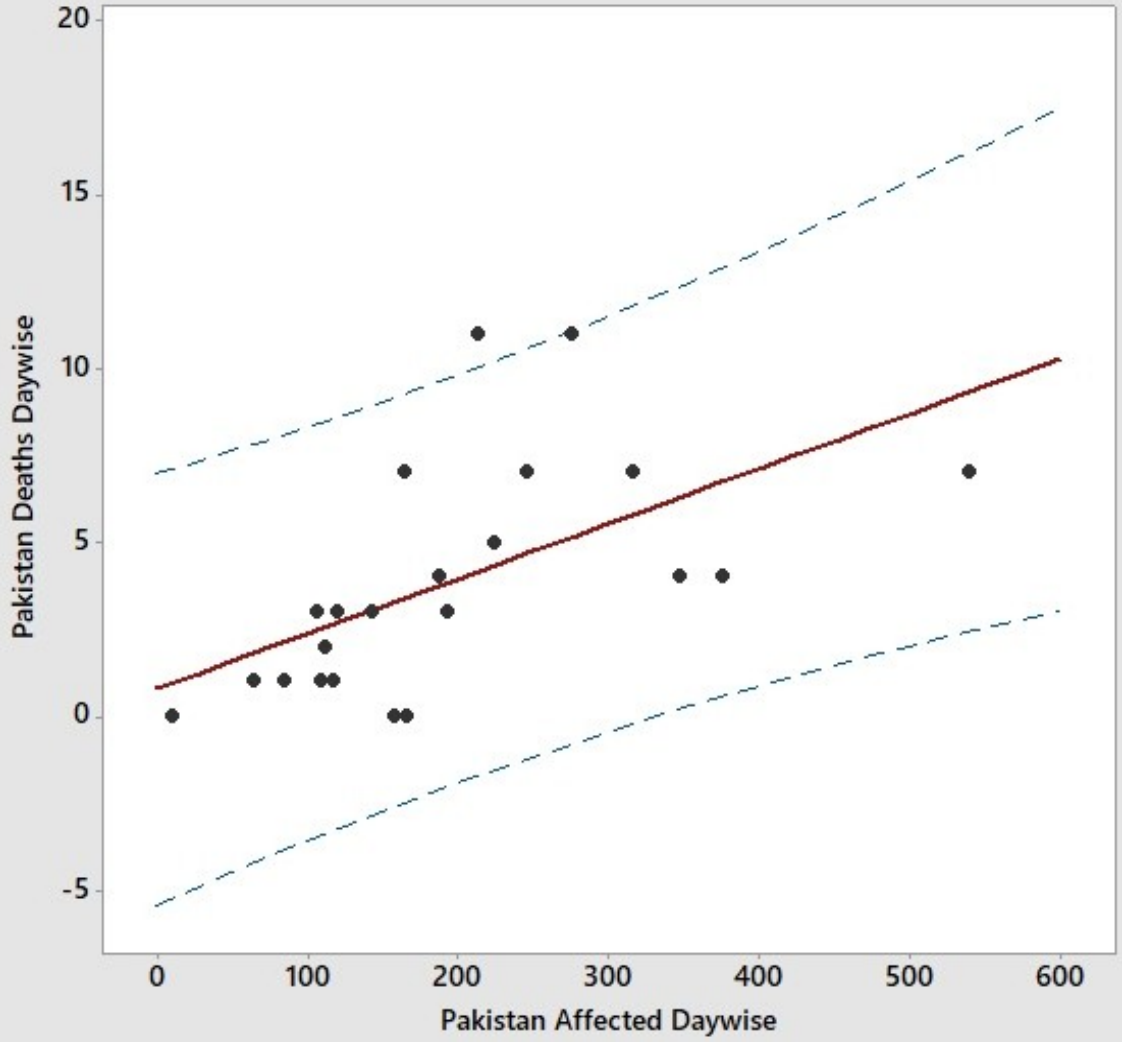
** Statistically significant ($p < 0.05$)*

Regression for Pakistan Deaths Daywise vs Pakistan Affected Daywise
Prediction Report

Y: Pakistan Deaths Daywise
X: Pakistan Affected Daywise

Prediction Plot

The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.

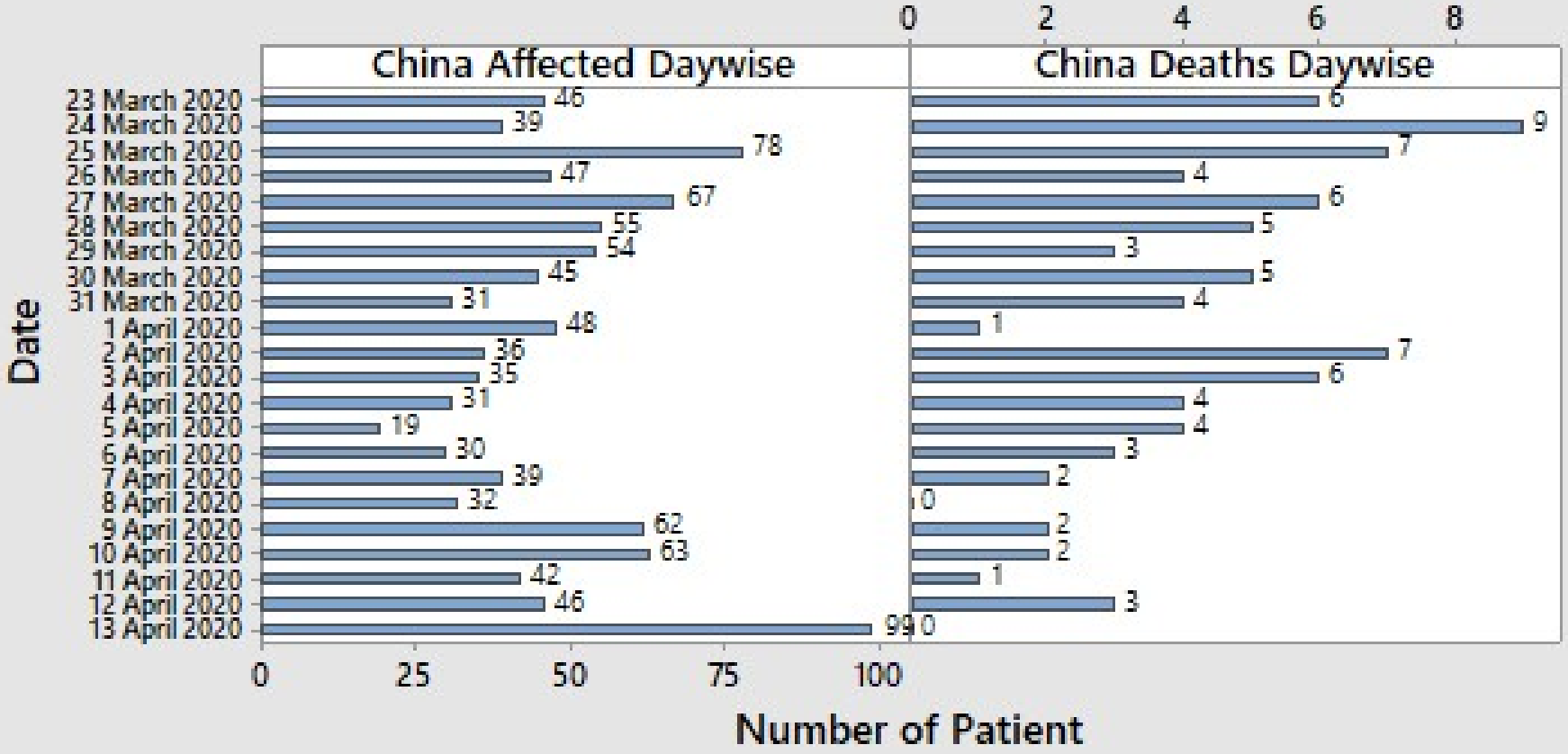


X	Predicted Y	95% PI
0	0.80277	(-5.4001, 7.0056)
25	1.1977	(-4.9252, 7.3205)
50	1.5926	(-4.4604, 7.6456)
75	1.9875	(-4.0062, 7.9812)
100	2.3824	(-3.5628, 8.3276)
125	2.7773	(-3.1306, 8.6852)
150	3.1722	(-2.7097, 9.0541)
175	3.5671	(-2.3003, 9.4345)
200	3.9620	(-1.9025, 9.8265)
225	4.3569	(-1.5163, 10.230)
250	4.7518	(-1.1416, 10.645)
275	5.1467	(-0.77838, 11.072)
300	5.5416	(-0.42637, 11.510)
325	5.9365	(-0.08536, 11.958)
350	6.3314	(0.24494, 12.418)
375	6.7263	(0.56487, 12.888)
400	7.1212	(0.87480, 13.368)
425	7.5161	(1.1751, 13.857)
450	7.9110	(1.4663, 14.356)
475	8.3060	(1.7487, 14.863)
500	8.7009	(2.0228, 15.379)
525	9.0958	(2.2891, 15.902)
550	9.4907	(2.5479, 16.433)
575	9.8856	(2.7998, 16.971)
600	10.280	(3.0450, 17.516)

STATISTICAL PERSPECTIVE OF CORONA ATTACK IN CHINA

COVID-19

Stay home, Save lives

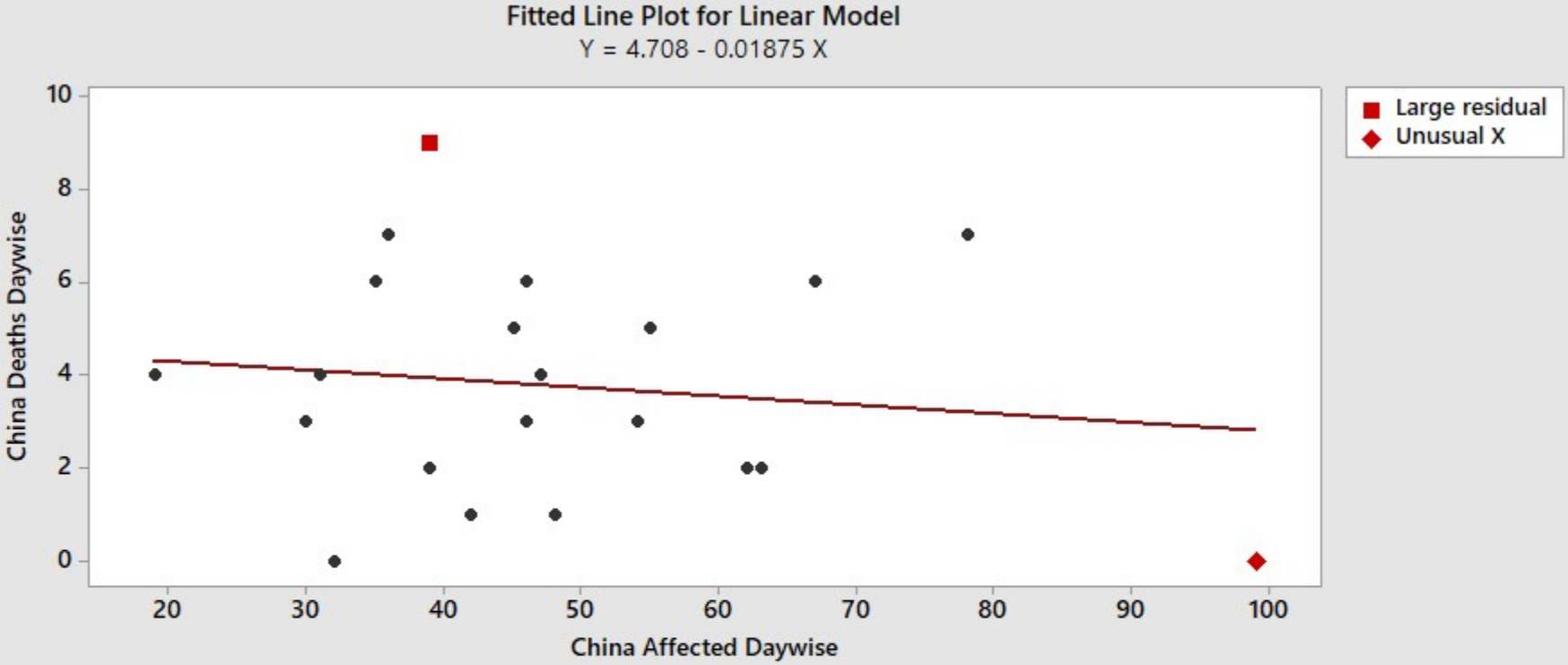


Thanks to "Thinathanthi" Tamil Daily in which Data was taken from 22 March to 13 April 2020

Analyzed by S.Lakshmanan, Psychologist

Regression for China Deaths Daywise vs China Affected Daywise
Model Selection Report

Y: China Deaths Daywise
X: China Affected Daywise



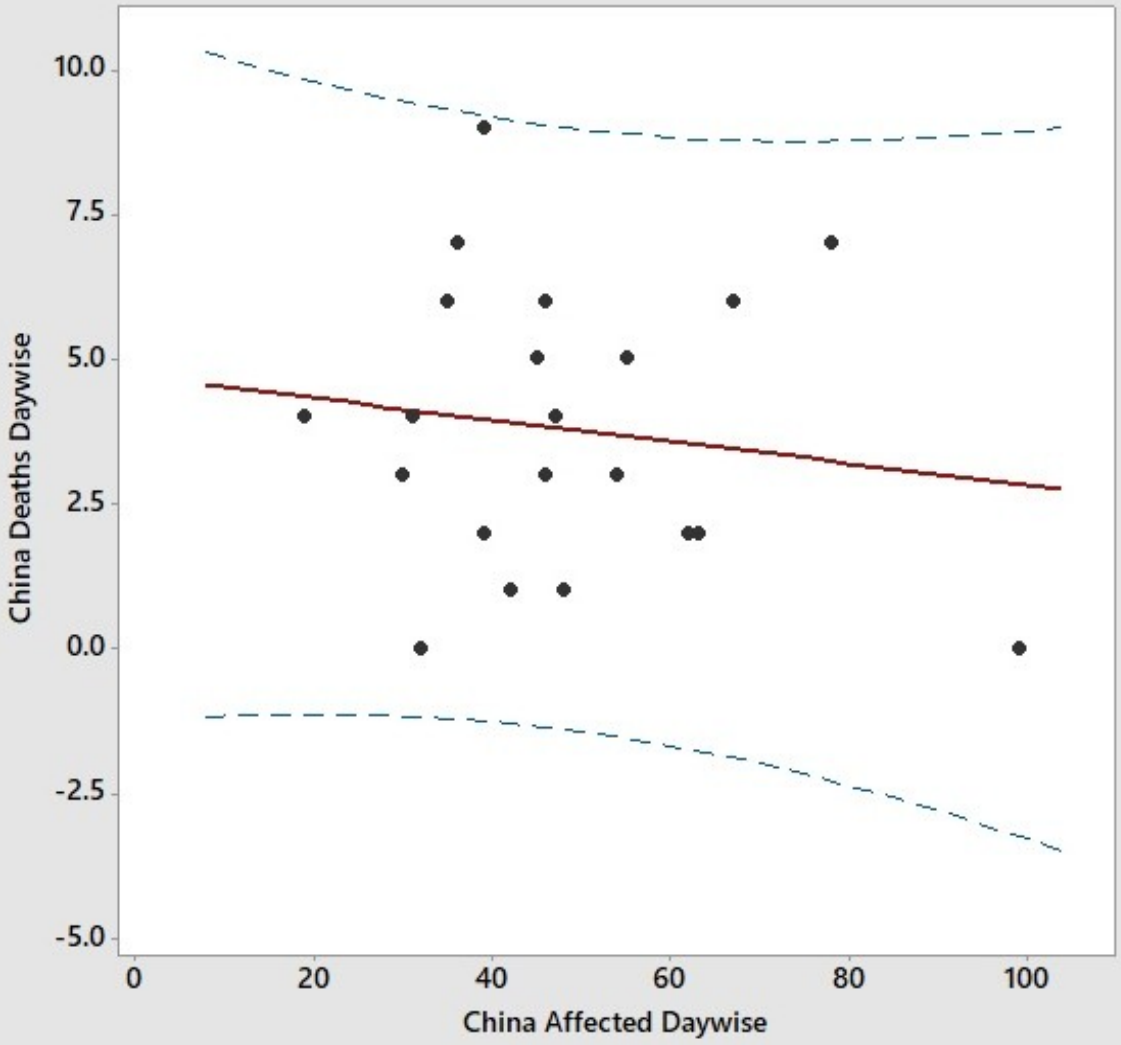
Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	0.00%	0.00%
P-value, model	0.530	0.557
P-value, linear term	0.530	0.470
P-value, quadratic term	—	0.382
Residual standard deviation	2.438	2.450

Regression for China Deaths Daywise vs China Affected Daywise
Prediction Report

Y: China Deaths Daywise
X: China Affected Daywise

Prediction Plot

The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



X	Predicted Y	95% PI
8	4.5580	(-1.1757, 10.292)
12	4.4830	(-1.1518, 10.118)
16	4.4080	(-1.1369, 9.9529)
20	4.3330	(-1.1316, 9.7976)
24	4.2580	(-1.1362, 9.6522)
28	4.1830	(-1.1512, 9.5171)
32	4.1080	(-1.1768, 9.3928)
36	4.0330	(-1.2135, 9.2794)
40	3.9580	(-1.2614, 9.1773)
44	3.8830	(-1.3206, 9.0866)
48	3.8080	(-1.3915, 9.0074)
52	3.7330	(-1.4738, 8.9397)
56	3.6579	(-1.5676, 8.8835)
60	3.5829	(-1.6729, 8.8387)
64	3.5079	(-1.7892, 8.8051)
68	3.4329	(-1.9165, 8.7824)
72	3.3579	(-2.0544, 8.7703)
76	3.2829	(-2.2026, 8.7685)
80	3.2079	(-2.3606, 8.7764)
84	3.1329	(-2.5279, 8.7938)
88	3.0579	(-2.7042, 8.8201)
92	2.9829	(-2.8891, 8.8549)
96	2.9079	(-3.0819, 8.8977)
100	2.8329	(-3.2823, 8.9481)
104	2.7579	(-3.4897, 9.0056)

Correlation Study of Corona Attack COVID-19

Understanding to the Level of Correlation

r – count score	Level of Correlation
0.00 to 0.199	Very Low Correlation
0.20 to 0.399	Low Correlation
0.40 to 0.599	Moderate Correlation
0.60 to 0.799	Strong Correlation
0.80 to 1.00	Very Strong Correlation

Source: Sugiyono, 2013

Correlation Study of Corona Attack COVID-19

Except China, All the data of these following countries have proved that there is a direct relationship with the rate of corona affected patients and the rate of death by corona attack is in Positive Correlation.

Name of the Country	Pearson Correlation (r)
India	0.903
England	0.900
America	0.871
Italy	0.867
Spain	0.688
Pakistan	0.577
France	0.519
Iran	0.345
China	-0.141

Regression Analysis of Corona Attack COVID-19

- Regression analysis is used to find how one set of data relates to another.
- This can be particularly helpful where want to use one measure as a proxy for another – for example, a near test as a proxy for a lab test.
- A regression line is the “best fit” line through the data points on a graph.
- The regression coefficient gives the “slope” of the graph, in that it gives the change in value of one outcome, per unit changes in the other.

Regression Analysis of Corona Attack COVID-19

- The regression equation can be applied to any regression line. It is represented by:
- Y = a + bx
- To predict the value y (value on the vertical axis of the graph) from the value x (on the horizontal axis), b is the regression coefficient and *a* is the constant
- The regression coefficient and constant can be given with their “stand errors”. These indicate the accuracy that can be given to the calculation. No one can worry about the actual value of these but look at their *p* values. The lower the *p* value, the greater the

STATISTICAL PERSPECTIVE OF CORONA ATTACK COVID-19

Conclusion

- There is a significant positive relationship exists between the rate of the corona affected patients and the rate of death patients by corona attack.

STATISTICAL PERSPECTIVE OF CORONA ATTACK COVID-19

Suggestion

- **Every country has needed to find corona affected patients urgently and has provided to proper treatments to the patients.**

Stay home, Save lives

Stay home, Save lives

Thank you Viewers
&
“Thinathanthi”, the Tamil Daily